AMERICAN AGRICULTURIST

FOR THE

FARM · GARDEN · & · HOUSEHOLD

"AGRICULTURE IS THE MOST HEALTHFUL, MOST USEFUL, AND MOST NOBLE EMPLOYMENT OF MAN."—WASHINGTON.

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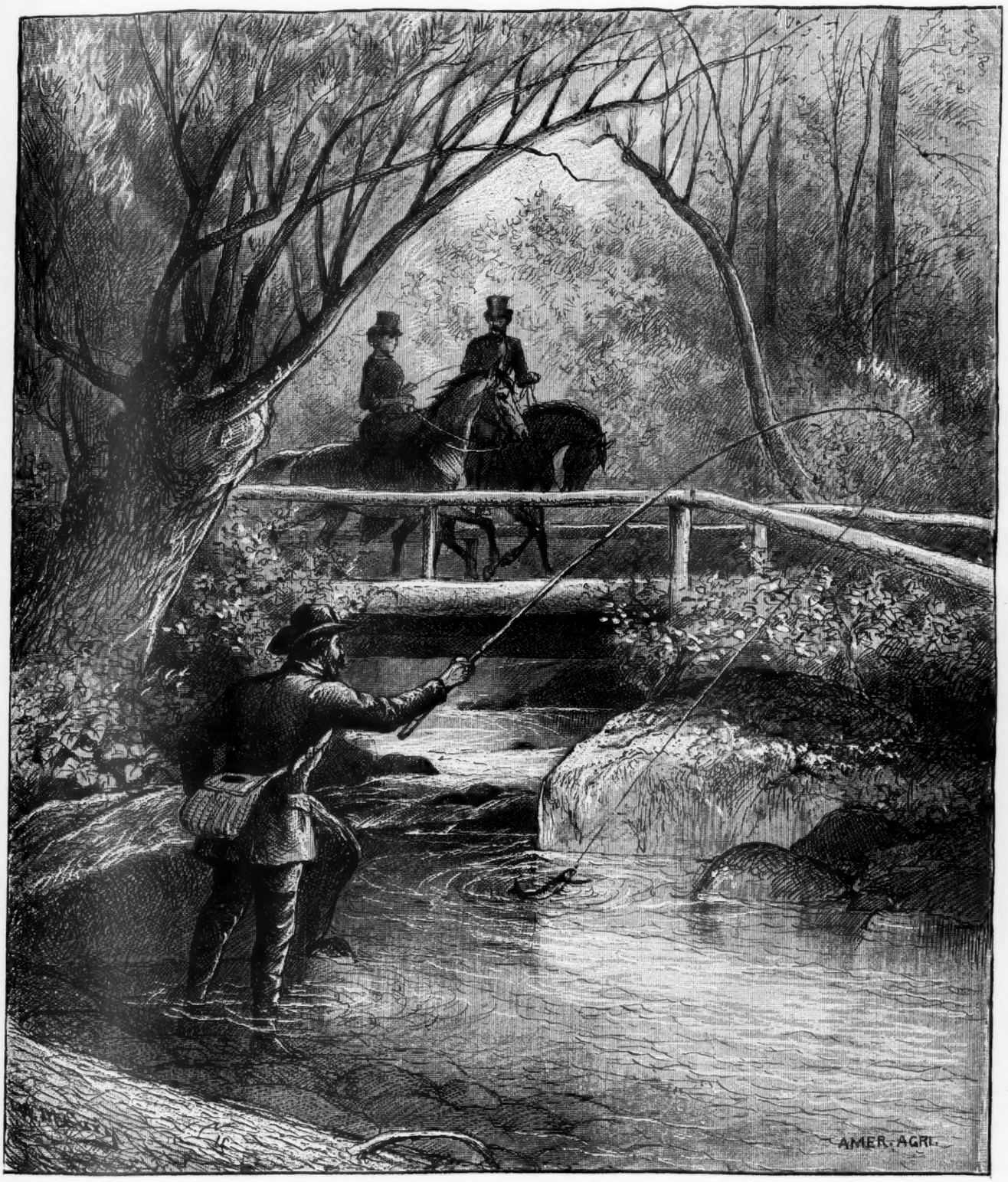

A MAY DAY OUTING.

Drawn (by Cary) and Engraved for the American Agriculturist.

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May.

Hail, bounteous May, that does inspire
Mirth, and youth, and warm desire!
Woods and groves are of thy dressing;
Hill and dale doth boast thy blessing.
—Milton.

FARM AND GARDEN WORK

MAY, 1888.

One of the most important questions for many farmers to decide, is whether it will pay for them to increase the area of the root crops. Root crops can be easily made a failure; they require attention at the proper time, or the weeds will get the mastery and the crop is ruined. A determination to succeed is necessary.....Parsnip is a root mainly confined to the kitchen garden, but it is one of the most valuable for the farm animals; it is about as nutritious as carrots, and, unlike those, perfectly hardy. If not convenient to harvest them, they may be left in the ground all winter, to be dug during a thaw or in early spring, and be all the better for the exposure. Fresh seed of the crop of the previous year is essential, and another to getting good crops is severe thinning to three or four inches in the rows. The roots are almost always marketable at paying prices.....Mangel-wurzel is an admirable root crop if given a rich soil and careful culture; the yellow varieties are preferred to the red, and some of the improved sugar beets are better than either.....Ruta-bagas may be made a profitable crop, if the soil is well prepared by high manuring and careful cultivation; where this cannot be given, the crop had better not be undertaken.....Indian corn is the great crop of most farmers. There is no crop so greatly influenced by care in the selection of the seed, and by giving proper attention to this, one can in a few years establish a variety better suited to his farm. The selection must begin in the field, selecting from stalks that bear more than one ear; selection for size of ears, number of rows, etc., can be made at harvest.....Grass lands, whether meadow or pasture, amply repay any attention in the way of fertilizing that may be given them. A top-dressing of plaster is very cheap and often works wonders, especially upon clover...Potatoes, at least the early ones to be planted, may be forwarded greatly by exposing them to light in a warm room. If it only has the effect to green them it will be a help.....Peas and oats sown together is a crop increasing in favor.....Make the first sowing of fodder corn as soon as the land is in proper condition.....Green manuring affords the cheapest and most effective methods of enriching the soil. Buckwheat is the best crop for a very poor soil, turning under two crops in the year. The next spring, early, clover may be sown, fertilized with a dressing of plaster, and if the crop is a luxuriant one, an early cutting of hay may be made; when the seeds are partially ripe the clover may be turned under. Where wheat is cultivated, the field is cross-plowed very lightly or the grain sowed upon the surface and worked in with a cultivator.....Southern cow peas, so valued in the Southern States as a renovator of the soil, while they will not ripen their seeds in the Northern States will make a heavy crop of vines of great value for turning under as a green manure.

Live Stock Notes.

Cows, if they graze on pastures, are apt to find the change to disturb their bowels and affect the quality of the milk. Continue the ration of hay and grain, and of roots also if possible, so that the change may not be too sudden.....Sheep need similar care in first going upon pasture. One great service of these animals on the farm is clearing the land of brush; pasture them where they do the most good in keeping down the tender shoots as they start.....All young animals must be kept growing. This is especially the case with young pigs. The first object with these should be to grow a frame-work, and they have no need of fattening food. Skim milk and wheat bran is the food to make them grow, and if to this can be added a run in a clover pasture in the orchard, where they can pick up a dessert of wind-falls (wormy ones preferred), nothing more is needed until fattening time.....Broods of chickens in the garden will destroy many insects. They will go to an artificial mother when the sun gets low, or run to it for safety if a hawk makes its appearance, as readily as to a coop with an old hen in it.....When the hens must be enclosed, give as large a range as possible, provide ample dust boxes, and plenty of gravel, or ground bones or shells. Many of the weeds from the garden make good green food for the poultry; any badly headed cabbages or the stumps of those that wintered well should go to the poultry.....Don't forget a daily supply of fresh water, and that skim-milk will forward the growth of young chicks as it will that of young pigs.

Orchard and Fruit Garden.

In most localities the planting of fruit trees will be completed. Better plant late than not at all. Nurserymen keep large quantities of trees heeled in so as to retard their growth, and fit them for late planting. If young trees were thrown out of their erect position during the winter, bring them to their position, and stake them, taking care that neither stake nor ties can injure the bark. When caterpillar nests are seen, remove them, using a swab, with kerosene emulsion or lime wash.....Commence to destroy the curculio. As soon as the plums are the size of peas, jar the tree with a sudden blow, catch the insects that fall upon a cloth and burn them.....Plant blackberries and raspberries early.....Set out cuttings of currants, gooseberries, grapevines, quinces, etc., that were kept through the winter.....If living in town or village plant one or two grapevines, if on a farm plant a dozen or two dozen vines, or enough to give the family all the grapes they wish, and have some to give your neighbors....Manure strawberry beds, working fine compost between the rows, and apply a mulch before dry weather comes on.

Kitchen and Market Garden.

Observe that there are hardy and tender vegetables; the former, such as peas, beets, parsnips, potatoes, and others, may go in as soon as the ground can be worked, the tender vegetables it is not safe to sow until corn-planting time, or when the danger of late frosts is over, and the soil is dry and warm.....Begin to weed the crops as soon as the rows can be seen.....Root crops should be thinned to three or five inches between the plants. Most of the thinning, or "singling" as the old country gardener calls it, can be done with a sharp hoe. Stick the peas or give them a wire support as soon as they come up.....Dwarf peas are capital for a small garden, as they can go in every vacant spot.....Asparagus should be cut thoroughly, removing all the shoots. A bed two years old may be cut very slightly; a full crop is not to be taken until the fourth year.....Lima beans need a warm and well-manured soil; set the poles before planting—red cedar makes the best poles—press half a dozen beans into the soil, eye-down; when up, thin to two plants, and if these do not take to the poles readily, help them. Asparagus, green peas, Lima beans, sweet corn, tomatoes, and melons, are things every farmer's family should have in abundance.

NOW FOR A BIG CROP OF CORN.

Practical farmers may well laugh at those who talk about corn being deficient in protein and phosphates. It is the grandest crop in the world. A well-filled corn-crib makes the farmer and his horses, cows, sheep, pigs, and chickens happy. Throughout a large area of the United States corn is grown for home use and not for sale. John Johnston, the father of American tile-draining, and one of the best and most successful farmers of his time, said to us: "I have never sold corn but once in my life—and that I gave away to be sent to Ireland during the famine." He grew large crops of corn, but fed it all out, stalks and all, to sheep and other stock, supplemented with oil-cake when it could be purchased cheap enough. He was a firm believer in oil-cake, but would have laughed at any one who claimed that it was worth more, pound for pound, than good sound corn.

In many sections last year the corn crop suffered from drouth. This is unusual. On good land, kept clean by the frequent use of the cultivator, corn will stand drouth better than any other crop. Said an experienced farmer: "I believe I could raise a good crop of corn if not a drop of rain fell from the day it was planted until the day it was cut." He looked to the stores of water in the soil, and was careful that no weeds sucked up this moisture and robbed the corn plants. Clover and other deep-rooted plants bring up nitrogen, phosphates, potash, and other plant-food from the subsoil, and leave them near the surface in the form of vegetable matter; a severe drouth does the same thing. Capillary attraction raises the water charged with plant-food, and, as it evaporates, leaves it on the surface. The great drouth of last year has left our land in good condition. Now for a big corn crop!

OUR FARMER BOYS.

There is a frequently recurring complaint from the farm, reached through the agricultural press, of the reluctance of boys to remain in farming pursuits, indeed sometimes even to enter on such a life. What is the cause of this restless and unwilling spirit? Are country employments odious in themselves? Is it a task more dreary or more dangerous to break a fiery colt than it is to face the winter as brakeman on a freight train? Is it more perilous to tend a Shorthorn bull than it is to be a policeman and club burglars? Is it worse to do chores as a small boy on his father's farm than it is to work for four dollars a week and pay traveling expenses to reach the office, where the boy is the scapegoat who is always wrong, and at whose door the shortcomings of every other employee lies? Is it harder lines to plough behind your own team, to drive your own mowing machine, or do a good part of your own carting, than it would be to work in a factory at any one of the various industries carried on throughout our land? While we are compelled to acknowledge that farming has its unsatisfactory points, none can disprove that much discontent is broadcast everywhere. The advantages offered by agriculture to its followers are: freedom not from duties but from personal inconveniences. It is the farmer's own fault if his house lacks comfort; the artisan must work in his employer's shop or factory—the larger the establishment the less the individual. How many type-setters have injured sight? How many brakemen are maimed and killed? How long is the dark list of mechanics worn out before they have reached maturity from the hardships incident to the duties of their callings. So take a look at a higher social grade as contrasted with what country avocations offer. It is appalling to note the young lives wrecked in cities: youths who strain every nerve and use every means to attain a profession, who just reach the threshold and then succumb, worn out in mind and crushed in body. Of the vast multitudes who year after year leave their country homes to seek fortune in cities, how many succeed? The percentage is very small, even of those who find a moderate amount of success. Some lack ability, others endurance, and many do not possess sufficient strength.

From these remarks it must not be inferred that dull and weakly boys are by nature best fitted to remain in the country and become farmers. The ablest men mentally are none too enlightened, none too capable, to cope with the many difficult problems of agriculture. To-day the land question holds the attention of Europe, and with our abundance of territory, as yet sparsely populated, we are not many generations distant from scarcity of land and its inevitable difficulties. The hardest part of farm life is its seeming monotony. We advisedly use the word seeming, because farm life is more varied than is professional or mechanical life. The four seasons bring to the farmer varied occupations and varied pleasures. The journalist, the lawyer, the doctor, in their callings know no seasons: three hundred and sixty-five days annually are the working days of those who toil in the paths of the higher professions. Artisans and mechanics enjoy rest on one day in every week. Railroad employees generally obtain two, sometimes three, Sundays' rest out of ten months of the year. During the fierce heat of summer the public will travel, and the railroad men, from the tiny newsboy to the general superintendent, must be at their posts.

Our counsel to boys is, before you decide to leave the farm for other work, seek information, and make as sure as you can that you are more fitted for city than for country life. To the farmers we would say, if your boys are well treated they will recognize it; if your boys are overworked, poorly clothed, badly fed, and boorishly treated, make haste to change and to mend your ways. A bad employer gets an unwilling service. The best tempered boy can be made sullen; the most ambitious can be discouraged. When a boy is old enough to work for his father, and when his work is satisfactory, he earns his pay as fully as though he was a hired outsider.

PRACTICAL FISH CULTURE FOR FARMERS.

SETH GREEN.

There are few people who fully realize the benefits to be derived from fish culture, and estimate its value from a practical standpoint. I find there are many who have read considerably on the subject, and have a fair conception so far as can be gained by reading, but who, never having seen a practical illustration of fish culture, are educated only so far as their imagination has shaped the scheme in their mind. I have thought of it so much, written about it so much, and talked about it so much, and have had so much literature on the subject placed before me, that it seems to me that everybody ought to have a pretty clear idea of what the artificial propagation of fish is; but of course in this I am mistaken, and it is not strange that I should be. With the view of instructing readers who have never had the matter explained to them, I will endeavor to describe its principles in as few words as possible.

We take a pair of fish, trout for instance, a male and a female; for, strange as it may seem, there are many who express surprise that the male as well as the female is required. However, this is the fact. To operate upon them artificially, both parents must be alive and healthy, and perfectly ripe. By the term ripe I mean that the eggs contained in the female and also the milt or vitalizing fluid of the male must be matured sufficiently to leave the fish free and easily, with but very little outside assistance. An ordinary milk pan is then placed on the floor or ground, having been previously rinsed out with water, and is tilted up on one side, so that the spawn and milt will readily collect in the lower side of the pan. Everything being in readiness the operator takes the fish in hand—the male first—and carries it close to the bottom of the pan. Then by a few dexterous movements down the sides of the abdomen he expresses the milt into the pan. The female is then taken in hand as quickly as possible and operated on nearly in the same way, except that the movements are slower and the forefinger is gently pressed on the abdomen, commencing low down toward the vent, and gradually working up toward the head. After this is done the eggs and milt are immediately mixed thoroughly by slowly tipping the pan, first one way and then the other, and water is gradually added until the pan is half full. This, in brief, is the process of the artificial impregnation of fish eggs, and by this means, if everything is favorable, from ninety to one hundred per cent of the eggs should be vitalized, as against less than twenty-five per cent in the natural way. After the spawn has been taken in the pan, a glutinous substance is formed which causes the eggs to adhere to the sides and bottom of the pan and to each other for about twenty or thirty minutes, after which it appears to dissolve and the eggs become detached from the pan and separated. As soon as this occurs they are washed by rinsing in several waters, and are then placed in the hatching apparatus, of which there are several different kinds. Here they remain from seventy to one hundred and thirty to forty days, according to the temperature of the water. If the water for the hatchery is taken directly from a spring where the temperature ranges from forty to fifty degrees Fahr., the former time is required. If it is taken from under the ice, where a uniform temperature of about thirty-four degrees is maintained, then it takes the longer time. After the fish are hatched they are encumbered with a yolk sac extending from the under part of the gills to the vent, and from forty to sixty days are consumed before this is absorbed, the fish re-

quiring no food till this is nearly gone. As soon as the fry reach this stage—or are able to "swim up," as the expression goes—they are ready to be deposited in the waters to seek their own subsistence, grow to a good size, and rejoice the angler who is fortunate enough to place his line so temptingly as to secure the prize.

ADULTERATION OF MILK.

CHESTER P. DEWEY.

There is a statutory standard of milk in New York and some other States. The New York law provides for the confiscation and destruction of milk, if that fluid contains "more than eighty-eight per cent of water or other fluids, or less than twelve per cent of milk solids which shall contain not less than three per cent of fat." Milk not up to this standard is pronounced "adulterated." This adulteration is produced in two or more ways. First, by removing a portion or all of the cream, which is a direct fraud upon the consumer's pocket, by depriving him of nourishment for which he has paid, and upon his health if he is living upon a milk diet of a given strength. A second mode of adulteration is by the addition of water, and with the water, of some substance to restore the color, and remove the "sky-blue" appearance, as anatto or rice flour. Chalk has gone into "innocuous desuetude." The water adulteration is also a robbery of the consumer, and may be the means of causing sickness by the introduction of disease germs. The source of water supply is rarely regarded by those who mix this fluid with milk, and whatever contamination is in the pump or well is sure to find a new field of harmful operation among the milk consumers.

The New York law is very rigidly enforced in New York City, as milk venders often find to their great detriment. No skim milk is allowed by law to be sold, and the Inspectors make frequent and unexpected raids upon incoming milk trains, upon the supplies of venders, and upon the carts of distributors, and thousands of gallons of condemned milk are annually turned into the gutters. Examination of the customs in regard to milk production, and the marketing of the same, in the milk region from which New York draws its chief supplies, will show, as it has already shown to the writer, that the farmers are not amenable to the charge of adulteration in either of the methods above mentioned. The milk as yielded by the cow is honestly sent to market. Recently, while the Legislative Committee was examining into the "Trusts" established in New York, information was sought as to the organization of a "Milk Trust," and from the testimony given, slurs were cast upon dairy farmers and reflections were made that naturally rendered them indignant. They were charged with the adulteration of milk and with the use of food prohibited by law, and prejudicial to the cows, to the milk production, and to the consumer, particularly to children. The best reply to the first charge is a statement from the State Dairy Commissioner, who gives the following results of inspection for a continuous twenty-one months:

1886 and Nine Months of 1887.

Dairies	7,413	Cans	23,651	Below standard	551
Peddlers	926	"	3,823	"	269
Store	1,395	"	1,966	"	176

This shows less than two and one-half per cent of milk "below standard" in farmers' cans, about seven per cent among peddlers, and nine per cent in the stores, exactly where the adulteration is most likely to be—in the thousands of petty shops from which the poorer people draw their petty supplies. Since September of last year the Dairy Commissioner reports a decline to one per cent in the quantity of adulteration in the milk from the dairies. The high quality of the milk is in one respect an answer to the charge that the farmers feed their cows on improper food. A certain amount of "grains" is not prejudicial. It is the excess that kills, and self-interest would operate to prevent the farmer from doing himself an injury in this way, by destroying productive cattle. The New York State Dairy Commissioner states that in the inspection of thousands of dairies few were found in default, and that "so few instances of improper feeding or neglect likely to affect the wholesomeness of milk have been discovered since 1885, that it may almost be said that none exists." The dairy products of this State are in great demand both at home and abroad, and have a high reputation in all markets. This standard for New York dairies, and for the dairies of other States, can only be maintained by a jealous regard for the cow and her product by every farmer, and by every creamery and cheese factory in the country. The farmers ought to have a higher price for the milk they sell, and that price would remove the few remaining temptations to the depreciation of the standard. A higher price would not mean increased cost to the consumer, only less profit to the middlemen. The farmers received low prices when oleomargarine was sold as butter, but since oleomargarine has been made to stand to its own colors, the farmers receive better prices, while the consumer pays no more for his butter. The report of the Massachusetts milk inspector for 1887 shows that Boston, with a population of 400,000, consumes 47,260 gallons of milk daily, or a little less than a pint to each of the population. The consumption of New York City is about half a pint a head. The quality of milk in Boston is inferior to that in New York, as the State Inspector's report shows. The percentage of poor samples in Boston in 1885 was 30.64; in 1886, 18.55; in 1887, 12.54. It will be seen that inspection is improving the quality of the milk and reducing the percentage of milk below standard. The Massachusetts inspector recommends a thorough and systematic examination of dairies in the State, and strict enforcement of the rule that milk awaiting delivery shall not be stored in stables, where it remains for hours absorbing corruption each moment.

The Legislative Committee on the "Trusts" made their report early in March, and were emphatic in condemnation of the "Milk Exchange, Limited," as "a monopoly of the worst sort." The Committee say that while this Exchange seems a small matter as compared with the great Sugar and Oil Trusts, yet when it is remembered that "the milkman who brings milk to town or city residents represents a commerce almost equal in this country, in aggregate value, to the whole sum of our foreign importations, this will be considered a subject worthy of attention." This corporation was formed with the ostensible design of buying and selling milk, but it assumes to fix the price of milk, to oblige the farmer to sell his milk to the Exchange at a low price (two or three cents), while to the corporation and the middlemen is reserved the pleasurable function of taking from consumers six, seven, or eight cents, and even more. The dissolution of the corporation, by the Attorney-General, is recommended. The farmers are entitled to deal with the consumer with as little intervention as possible.

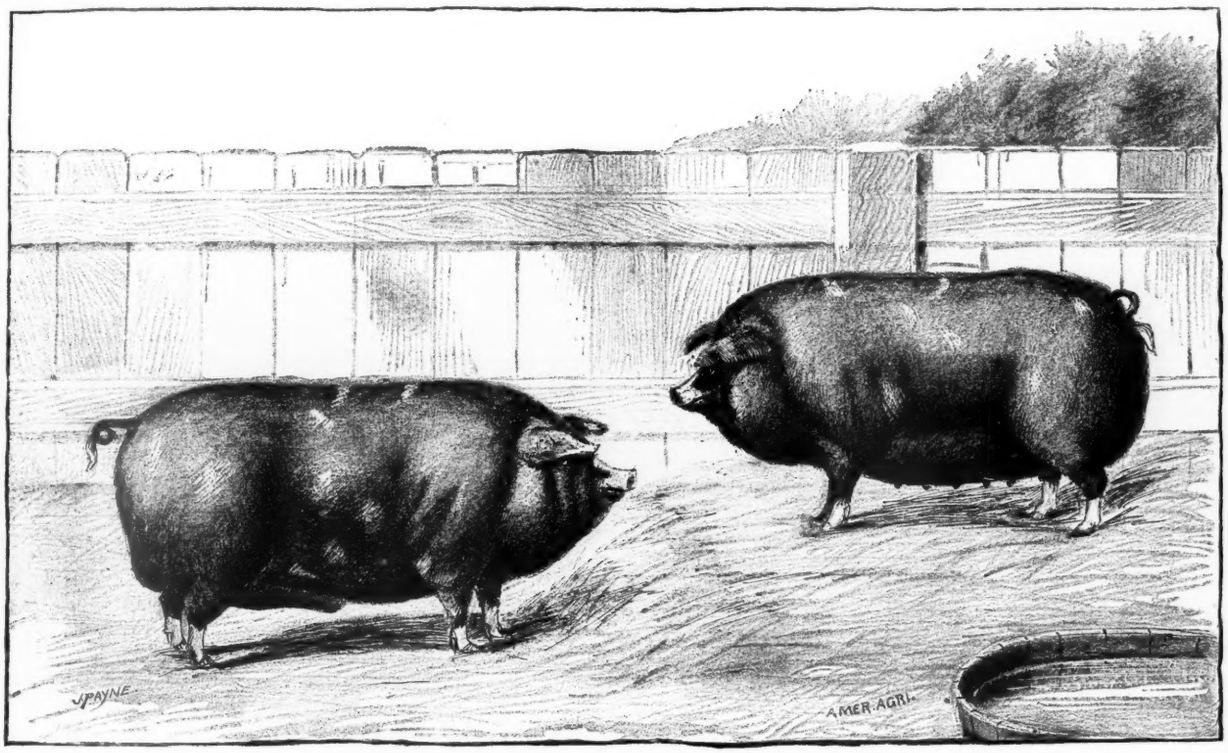
How to Grow Tomatoes in Perfection.—Because the generous nature of the tomato yields bountifully with seemingly little care and attention, the general impression prevails that the plant requires but little attention. This is a sad mistake, for there is not a vegetable in the garden that is so gross a feeder, nor one that so readily pays for all the food and care given as the tomato. To grow it to the greatest perfection, the hills should be dug out to the depth of two and a half feet; at the bottom there should be a half bushel of well-rotted manure; above this let the soil be an equal mixture of loam and manure thoroughly mixed. The hills should be at least six feet apart. Let the situation be open, warm, airy. When the fruit begins to set mulch with clean straw or very small brush. Under these conditions six plants will furnish sufficient tomatoes for a family of twelve persons. Whatever variety may be planted in this manner, the result will show specimens for size, smoothness, and esculent properties, unknown to the variety when grown in the ordinary manner. C. L. ALLEN.

Market Gardens in France.—In Paris and other large cities in France manure is produced in the stables of the omnibus companies in such large quantities that it is sold at a very low rate, and the market gardeners pay enormous rents for land upon which to make their gardens. This manure is not used to fertilize their crops but as a source of heat. The culture is carried on upon a series of extended hot-beds. The vegetables forced are disposed of in the markets of more northern cities. The operations commence in the autumn previous, when the manure is collected and brought into proper condition for use. All the vegetables are forced, so as to be much earlier than they would be in the open ground. A bed of dung about sixteen inches deep is covered with six inches of rich soil, and frames with glazed sashes placed upon this. Quick-growing crops are those generally raised. Lettuce is raised in great perfection; so are radishes. Cauliflowers are extensively grown, and asparagus is forced in large quantities. The manure used in these beds has lost little, if any, of its fertilizing qualities, and is sold to farmers to be used on their crops. The products of a majority of these gardens go to Berlin, Moscow, and St. Petersburg, and even to England. Buyers come from these markets, make their purchases at the garden, cut and pack them for transportation, and send them off. High prices are paid, but only the first products are raised. Some gardeners devote their land exclusively to cucumbers and melons, to mushrooms, or some other profitable specialty in vegetables.

POLAND-CHINA SWINE.

The Poland-China is a strictly native American breed of swine, the product of the skill and perseverance of American breeders. The breed originated in the Miami Valley of Ohio, its first beginnings having been made about half a century ago. The hogs were called "Magie," from one of the pioneer breeders, "Butler County," "Warren County," and other local names, which led to much confusion. In 1872 the National Swine Breeders' Association decided upon the name of "Poland-China," by which they have ever since been known. Large amounts of ink and lung power have been expended in discussions regarding the origin of the breed, but out of it all the essential facts have become pretty well established. It is needless here to cite the names of breeders, and the minute particulars. Doubtless the breeders themselves "builded better than they knew," and little dreamed that the breed of swine they were forming were destined to the wide-spread and lasting popularity it has attained. It is a breed made up from crosses of the Bedford or Woburn, the Irish Grazier, the Byfield, the China, the Polish or Podolian, and the Berkshire. Of these, the first four are white or spotted breeds, the Polish is red or sandy with black spots, and the Berkshire is mainly black. In the rich valley of the Miami, with its luxuriant grass and corn crops, pure and abundant water, and above all, skillful farmers, the various breeds were crossed, the progeny carefully selected and bred, until a thoroughly well-established type was fixed. In the hands of energetic and enterprising men, the hogs of this type have spread throughout the great corn-growing regions, until they now outnumber every other breed of American swine. In color the Poland-Chinas are black, with white spots irregularly distributed. It is observable that many Western breeders are encouraging the black color, and "breeding off the spots." The form and general appearance of these swine are so accurately shown in the accompanying engraving, that no detailed description is necessary. The peculiar points of excellence claimed for the Poland-China hogs are great powers of assimilation, quiet temperament, fine quality of meat, and small per cent of offal in the dressed carcass. They are good graziers, thriving and making growth on clover and grass from spring until autumn. They fatten rapidly on grain, attaining a weight of two hundred to three hundred pounds at six to eight months old, and if kept over continue to increase in size and weight until they are five years old. Their pork, when raised on grass and finished with corn, is well marbled or streaked with fat and lean, the hams are round and well shaped. In the small proportion of waste or offal, these hogs have been shown by tests at the Chicago fat-stock shows to be unsurpassed by any other breed.

The breeders of these swine have shown a commendable degree of enterprise. The American Poland-China Record Association is national in its character, and there are also local societies in Ohio, Indiana, Iowa, Kansas, Missouri, and Illinois. The records of these societies are carefully kept to insure pure breeding. In addition to this work, the organizations are active in everything designed to promote the general interests of swine husbandry.



THOROUGHBRED POLAND-CHINA SWINE.

Drawn and Engraved for the American Agriculturist.

FEEDING YOUNG PIGS.

If the young pig is not getting enough milk from its mother to push it, which usually occurs about the fourth or fifth week of its life, fix little troughs so that none but the little ones can have access to them, and give the pigs two or three small rations daily of cow's milk. It is not best at the start to feed whole milk, or, if so, it should be diluted with one-third water and fed to them warm and perfectly sweet. Half a pint at a feed until they are six weeks old will be found a liberal allowance, in addition to what they get from the sow. After the eighth week they may have the whole milk, and the quantity may be increased gradually until they have all they will consume. About the tenth or twelfth week, if a small ration of corn meal is added to the milk, the pigs will quickly respond with added growth and appearance. The milk is making bone and muscle, and the corn meal will interlard a streak of fat that will give to the hams and shoulders that fine marbled appearance that butchers and connoisseurs delight in. If the feeder is near a city or large home market, where he can supply certain butchers, it is no hard matter by a little care and foresight to establish a brand of butchers' pork that will readily command one or two cents above the market. But there must be real excellence in the product. It cannot be done with any kind of a pig, by simply making it very fat. For this kind of feeding the Berkshire and Essex, if pure bred, are particularly well adapted. By following the plan indicated above, with grass or clover in summer, and steamed fodder or hay in winter, it is no trouble to turn off pigs of 200 to 250 pounds weight at seven or eight months, and this is the most that butchers want for the local market, while during the summer 150 pounds suits them better if rightly fed.

This, however, applies chiefly to small farms and nearness to market, and no doubt the same practice can be followed by

thousands of our largest feeders with added profit to their present course. It is within the observation of thinking breeders, that if there is any hog disease in the country certain ones seem to get more than their share of it. This is for the most part due either to in-breeding, or to an exclusive corn diet. Either of these will debilitate the constitution, and are especially to be guarded against if one would be successful in this business. As to how long the milk diet can be profitably continued, we desire to quote an experiment made by Prof. Shelton, at the Kansas Agricultural College. His experiment was made with ten pure-bred Essex pigs, whose average age was eighty days, and the average weight forty-one pounds and a fraction. They were divided into two lots of five each, but each pig had a pen to itself. Soon after the experiment began, one pig had to be withdrawn on account of sickness. One lot was fed new milk fresh from the cow, with shorts; the other lot shorts and water. All feed was accurately weighed, and several facts are deducible from the experiment, but we wish chiefly to use it in its relation to milk as pig food. The result after feeding 100 days was that those which received the milk diet weighed 141 pounds, while those that got no milk weighed 101 pounds, a difference of just forty pounds each in favor of the milk. But this is not all. Prof. Shelton says: "The milk-fed pigs at the end of the experiment were ripe and ready for the butcher, while those that were fed on shorts alone were quite unsalable. . . . The pigs which had received the milk were sold to the butcher at the highest market price; the others, with possibly two exceptions, were salable only as 'stockers.' . . . Indeed, three of them did not weigh, four months later, as much as the milk-fed pigs did at the end of the experiment."

Fig. 1.—ROOT CUTTING AND GRAFT.

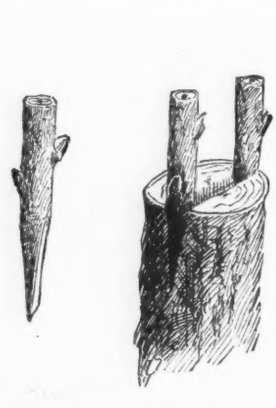


Fig. 2.—CLEFT GRAFT.

PROPAGATION OF THE QUINCE BY CUTTINGS AND GRAFTING.

W. W. MEECH, N. J.

PROPAGATION BY CUTTINGS is probably the best method of multiplying quince trees. Cuttings of large branches are better than those of small shoots. The amount of wood seems to measure the vital force to form both roots and tops. From twelve to fifteen inches is a good length, enabling us to plant deeply, and so guard against drouth. Small cuttings may be cut shorter, and have a piece of apple or quince root grafted on to push them. The chief thing is to guard against the exhaustion of sap by evaporation until roots are formed. Facilities for regulating light, heat, air, and moisture with precision will enable us to succeed with a succulent cutting furnished with a few leaves. When the air is warmer than the earth, buds are excited more than roots; and when the ground is warmest, root growth is most excited. Hence the custom of burying cuttings inverted during the winter, to keep the buds dormant while a callus is forming for the emission of roots.

Fig. 3.—SPLICE GRAFT.

Fig. 4.—SADDLE GRAFT.

In preparing small cuttings to graft upon roots, the chief thing is to have the cut ends fit, so that the inner bark shall match at least on one side and at the end, as shown in figure 1. These grafted cuttings may be quickly dibbled in, making a hole deep enough to receive the entire length except a bud or two above the surface. Holding the cutting in the hole at the right depth with the left hand, push the earth firmly against the cutting with the dibble, as you would in planting a cabbage. For lack of such firming the earth there are many failures. The fall, after the leaves have dropped, is generally preferred for taking the cuttings; but they may be taken much later. I have had some cuttings grow in the open air which were made in May after the trees were growing. Root cuttings a foot or so long are best prepared before the buds swell in spring. Plant at an angle of about forty-five degrees, or as near as you can to their natural position.

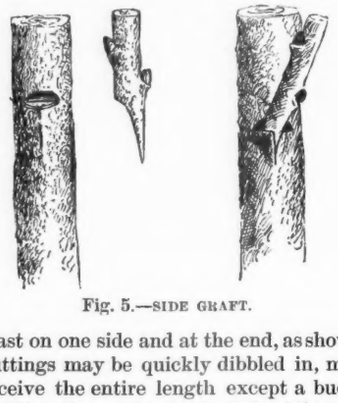


Fig. 5.—SIDE GRAFT.

Fig. 6.—DOUBLE SIDE GRAFT.

PROPAGATION BY GRAFTING is successful where the inner barks of both stock and cion are made to fit together. A union forms most readily between varieties of the same species; next between species of the same genus, and is limited by genera of the same natural order. By this law one variety of quinces will do best grafted on another; and next on the apple, white thorn, and Juneberry. On the white thorn it escapes the borer. The choice of wood for cuttings is last year's growth from near the center of the tree. Be sure they are from healthy and vigorous trees. If trees are propagated from bearing wood they will come into fruit sooner than if from blind wood. Here is a reason for the difference in the bearing age of trees from the same parentage. Spring is the best time for grafting, except the root grafting already described. In early spring we work by the methods best suited while the bark adheres to the wood, and later by those suited to a bark easily separated from it.

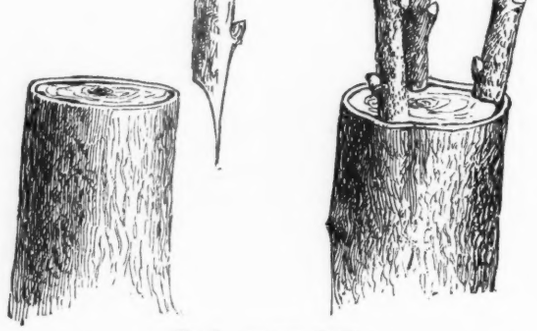


Fig. 7.—CROWN GRAFT.

Cleft Grafting is the most common method, and is done by cutting off the stock smoothly, and splitting it down from an inch and a half to two inches, according to the size of the stock and the thickness of the cion. Into the cleft set the cion, with the end cut wedge-shaped, the outer edge a trifle thickest, and so placed that the liber or inner bark of the graft and stock shall match, as shown in figure 2, then bind with bast and cover all exposed parts with wax or clay, and the work is complete.

Splice Grafting or *Whip Grafting* is only adapted to small stocks. If the stock and cion are of the same size, they will make a perfect match. If one is larger than the other, they will match on one side and end. Cut each with a slope about an inch and a half long, and make a tongue for convenience in matching the parts. Bind together and wax well, as seen at the right side in figure 3.

Saddle Grafting is a modification of whip grafting easily understood by the illustration (figure 4).

Side Grafting is a simple way of propagation free from some of the objections to cleft grafting. It is a very convenient method of inserting a limb to restore a balance to the head, or provide shade for exposed parts. The first method (figure 5) is like budding with the bud extended to a cion. The second (figure 6) is like cleft grafting in a cut on the side of a tree or limb.

Crown Grafting (figure 7) differs from side grafting by having the stock cut off as in cleft grafting. It is specially serviceable for stocks too large to split, and is best done when the bark will slip. The stock is not split, but the tongue of the cion is slipped down under the bark as in budding.

The advantages of cions with only one or two buds are, that they do not dry as soon as longer cions, they afford less leverage to winds, and are less liable to be injured by birds lighting on them.

NARCISSUS, OLD, NEW, AND RARE.

The Narcissus, in some of its many forms, is one of the oldest as well as the most beautiful of our garden flower bulbs. Under their popular divisions of jonquils, daffodils, polyanthus, narcissus, etc., they are all species of the genus *Narcissus*. Like some other plants, these have their fluctuations of fashion, and, had it depended upon amateur cultivators and the "trade," some of the varieties would have been lost sight of; fortunately most of them have been preserved in botanic gardens. For the last twenty or thirty years, they have been much less cultivated in our gardens than formerly; indeed, for the best account of species of all but the very newest, we must go back to old Parkinson, over two hundred and fifty years ago (1629), whose wood-cuts of that day, if not elegant, show plainly the plants he intended. Botanists have occasionally "revised" the genus, and as with *Amaryllis*, have divided it up needlessly into various new genera. Lobel (in 1570) and Gerarde (in 1596) both devote considerable space, in their celebrated works, to the narcissus.

Numerous kinds of narcissus are imported by the bulb dealers every autumn, and though not so hardy as hyacinths and tulips, by taking proper care they may be grown in the open ground, while all may be cultivated in pots or boxes in the greenhouse or window-garden; the delicacy and the fragrance of their flowers will amply repay any care that may be given. It is advised not to move the bulbs in the open ground for several years, when they are once established; if given protection of litter each winter, they will bloom on for several years. A very common plant in old gardens is the Pheasant's-Eye, or "Poet's Narcissus" (*N. poeticus*), where it not rarely fails to bloom, and we are often asked what is the trouble.

Fig. 1.—NARCISSUS BULBOCODIUM.

These plants were set out many years ago, and the bulbs have gone on increasing, and forming a clump so dense that the soil about it is quite exhausted, and the flowers are not produced because they are starved. Taking up, division, and resetting in a fresh spot is an effective remedy. In the popular division we have the "Poet's Narcissus," one of the best known; the "Polyanthus Narcissus" (forms of *N. Tazetta*); the "Daffodil" or "Daffadowndilly" of the English gardens, names supposed to be from *Asphodel;* Lent Lilies is another name, given on account of their season of bloom in Britain. These are among the largest-flowered forms; they come from *N. Pseudo-narcissus* and *N. incomparabilis*, and give flowers wonderful for size and beauty.

The many species of *Narcissus* are conveniently brought together in three groups, founded upon the size of the crown as compared to the length of the divisions of the flower. Hence we have: Group I., *Magnicoronatæ*, the "Large-Crowned Division." Of these more will be said presently. Then, Group II., *Mediocoronatæ*, the "Medium-Crowned Narcissi." This comprises a number of well-known species, including *N. juncifolius*, the true "Jonquil," and named from the rush-like character of its foliage, and so esteemed for the fragrance of its flowers; it has produced several varieties. Group III., *Parvicoronatæ*, the "Small-Crowned or Little Cupped Species." In these the crown is less than half as long as the divisions of the flower. The "Poet's Narcissus" or Pheasant's Eye (*N. poeticus*), already alluded to, is one of the best known of this group. The divisions of the perianth are of the purest white, while the cup or crown, which rises but slightly above these, is yellow, with purplish or reddish edge. The popular Polyanthus Narcissus, which produces its flowers at the end of the stem, in clusters of twenty, more or less, belongs to this group.

Fig. 2.—NARCISSUS CYCLAMINEUS.

A collection of hardy narcissus in flower is a charming sight. Messrs. Woolson & Co., of Passaic, New Jersey, make a specialty of the species of narcissus; the hardy ones will present a grand show soon, but the tender kinds have been in bloom in their cool houses in April, and they have presented an interesting sight, both to those who would admire them as flowers or study them as species. Those cultivated in the houses are chiefly of the "large crowned" section, especially the "Hooped-Petticoat Narcissus" (*N. Bulbocodium*) and its varieties. The type, the original "Hooped-Petticoat," is a little tender in our climate, but it is most suitable for greenhouse and window culture. This species has produced several varieties, differing greatly from the type, which we here give in figure 1. It has slender leaves and flower-stems from four to eight inches high, the stems bearing but a single flower. The flower varies from one to two inches in length, and the crown is very large in proportion to the size of the divisions of the flower. The peculiar shape and distended character of the crown, if compared with plates of the dress fashions of two centuries ago, will show "Hooped-Petticoat" to be a descriptive name. This species has produced numerous varieties, which differ in the length of the leaves and flower-stem, and charac-

ter of the flowers. Some of the flowers are of the most elegant shades of citrine and primrose-yellow; others are of the richest orange, while others are of the purest white; this, joined with the peculiar crape-like texture, was delightful to look upon. But the gem of this collection is a plant which asserts to have an existence, but is badly off for a place in the books. Its history shows what may befall a plant. Many years ago a species was described in books, and known in the older collections, as the "Cyclamen-like Narcissus" (*N. Cyclamineus*). This plant was described in 1802, in "Redouté's Liliaceæ." A few years after this, we find authors denying the existence of such a plant. Last year Messrs. Woolson & Co. received from a botanical correspondent in Portugal some bulbs with the long missing name of *N. Cyclamineus*. At the time of our visit, these were in fine flower—a large pan full of them. Figure 2 gives the general appearance of the plants. The stem is about four inches high, and bears a single flower. The leaves, about the same hight, are flat and very broad for this group of the genus. The flower is one inch and a half long, the crown tubular and narrow, about nine lines long and five lines in diameter at the mouth, where it is irregularly blunt toothed. The broad discoid stigma not reaching within one-fourth of the mouth of the crown. The divisions of the perianth (petals) are lanceolate, about the same length, and of a pale yellow slightly tinged with green—sufficiently so to contrast with the crown. The divisions are sharply reflexed, in such a manner as to quite hide the ovaries, which appear to be generally fertilized. The manner in which the divisions of the flower are bent back not only remind one of the *Cyclamen*, but impart to it that quaint, knowing expression so peculiar to that plant. All plant-lovers will agree with us that this restoration of a lost species to cultivation is a matter of interest, all the more so when, as in this case, the plant is so well worth saving.

THE SUFFOLK PUNCH MARE AND HER FOAL.

Engraved for the American Agriculturist.

FEEDING THE FAMILY HORSE.

A. B. ALLEN.

Hay is most esteemed in the Northern and Eastern States, made from grasses in the following order: Timothy, herds grass or red-top, orchard grass, ray grass; and both Alsike and red clover. The two latter are best grown mixed with the above grasses. If grown and fed alone, they must be free from dust, otherwise it might be injurious to the health of the horse. All should be cut in full blossom, and cured as much as possible in the swath, windrow, or cock, as this best retains their sweetness and tenderness. The Kentucky blue-grass is highly valuable where it grows freely, and many prefer it to all other grasses for hay. Every one of the above makes excellent pasture.

In the valleys and on the vast plains east and west of the Rocky Mountains, several very nutritious species of grass grow naturally, alike excellent for pasture and hay. Alfalfa or Lucern grown there gives three to four heavy cuttings during the season, under proper irrigation, but it must be fed with caution when green, for fear of colic. All Eastern grasses may also be freely grown there. At the South, Japan clover is most highly prized, and next follow Bermuda grass and Johnson grass, while a few grasses natural to the country and elsewhere are more or less esteemed. Northern cultivated grasses and the millets are also successfully grown there in different sections.

At both the North and South, oats, wheat, rye and barley are useful for pasture before getting too rank; and cut when the grain is in the milk, just before it begins to harden, and properly cured, these make excellent hay, more especially the oats. Corn-stalks are best grown of the sweet dwarf sorts, in rows two to three feet apart, and the stalks standing about three inches apart in the rows. They are sweeter then and far more nutritious than grown up thickly from the seed sown broadcast. Cut when in the silk or a nubbin begins to form, and properly cured, my horses greedily eat the whole from butt to tassel, and often prefer them to choicest hay when both lay side by side.

GRAIN AND MEAL.—Oats and barley are preferred in the order named, and are best ground. Corn alone is too fattening, and occasionally gives colic. It should be ground and fed about half and half mixed with wheat bran. Some think unbolted wheat and rye flour are superior to this mixture, and if found too rich or heavy, a little pure bran may be added to them to increase that already left in the ground grain. To each of the above half a pint to a pint of linseed or oil meal may be added night and morning. This promotes digestion, slightly lubricates the intestines, and causes a better relishing of the other food. At the South, cotton-seed meal takes the place of this, but it occasionally affects Northern animals unfavorably, and must therefore be fed cautiously. Hay passed short through the fodder cutter to the amount of a peck or half a bushel, with the meal ration mixed in it, and then wet up, is often fed twice to thrice a day in addition to long hay; but this occasionally causes severe colic to the horse. When ascertained, change this ration to hay and meal dry, each by itself. A few quarts of roots per day, when no other green food is given, are highly beneficial, as they soften and promote the digestion of the dry food. Carrots are the best, sugar beets and mangels next. Parsnips, I know not how truly, are said to affect the eyes; yet I do not see how this should be. Potatoes and turnips, unless cooked, are apt to bring on scours.

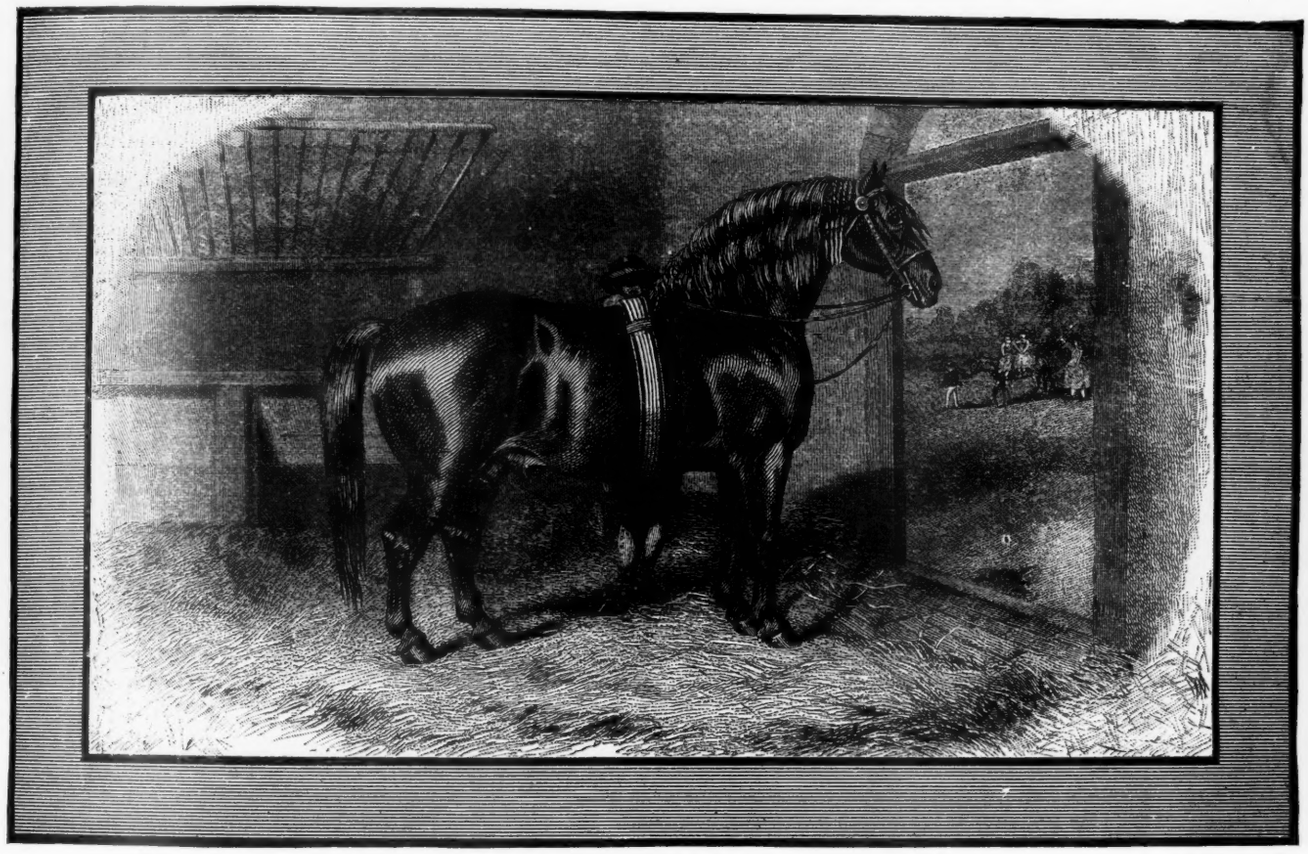
SALT, ASHES, AND SULPHUR.—Keep constantly a good-sized lump of rock-salt in the feed-box for the horse to nibble at pleasure. It will then take just so much and no more than its appetite craves, and is needful. Give a heaping tablespoonful of clean wood-ashes twice a week in the meal ration, and the same quantity of sulphur two or three times per month, as all these are conducive to health, and serve to ward off disease.

PASTURE.—If the horse is not at extra fast or hard work, it is best to pasture it when convenient through the growing weather, unless flies and mosquitoes are quite annoying; then it should be stabled during the day and turned out during the night. If the grass is abundant and of a good quality, the horse will eat enough during this time to support it well, with the addition of hay and a few quarts of meal at noon in the stable, which ought to be moderately darkened to keep out the flies. See that the horse has access to plenty of pure water in the pasture.

THE TEETH.—Examine the back ones occasionally, and see that none have grown up longer than others. If so, the horse cannot masticate its food properly, and they must be filed down to a level with the rest. Files are made expressly for this purpose. Also look for decayed teeth, and if found extract them. If lampas is formed, feed a little hard corn, and the mastication of it will soon wear this off. The corn may at first give some soreness to the gums; if so, stop it a few days until relieved, and then feed again. This is considered much better than lancing, and nothing like so barbarous and painful to the horse as burning with a red-hot iron, as is sometimes done. Lampas is merely a congested condition.

THE SUFFOLK PUNCH BREED OF HORSES.

The invention and general employment of sulky plows, self-binding harvesters, and other heavy implements in farming has created a demand for draft horses of more powerful build than the typical farm horse of the past. Clydesdales, Shires, Belgian and French draft horses are multiplying rapidly throughout the country, and there is still a call for more heavy horses. In response to this demand, several enterprising breeders in the Western States have recently introduced stallions of the heavy sorrel breed of English draft horses known as Suffolk Punch. This has long been a favorite breed in the eastern counties of England, and in London. The Suffolk Punch was, according to Youatt, bred originally from Norman stallions and the native draft mares of Suffolk, which are supposed to have descended from Flemish horses brought across the North Sea. The old type of Suffolk Punch was fifteen to sixteen hands high, with large head, thick withers, low shoulders, deep round chest, full flank, and, as its name indicates, of punchy form generally. These ponderous, clumsy-looking, but honest and powerful horses have been somewhat modified by crossing with half and three-quarter bred horses from the northern shires. It is taller, finer in the head and shoulders, and less inclined to the Flemish type in general form. The Suffolks of modern form are generally sorrel in color, and retain in a large degree honesty and stanchness. Andrew Henderson, in his "Practical Grazier," says: "I have seen these animals pulling upon their knees for anxiety to take their draughts with them." Lawrence, in his "Treatise on Horses," remarks of the Suffolks: "Their superiority over all other horses at drawing dead pulls is no doubt in some measure owing to early training, as in no country is so much pride taken in teaching horses to draw, and it is well known that a team of Suffolk horses, the signal being given, will fall down upon their knees, and leave nothing behind them that is within the power of flesh and blood to draw away." For teaming in cities, as well as for heavy work on the farm, the Suffolk Punch will doubtless prove a valuable acquisition to the horse stock of the United States. The accompanying illustration shows a Suffolk stallion of modern form, and on the opposite page is a spirited picture of a mare and foal of the same valuable breed.



A HIGH-BRED SUFFOLK PUNCH STALLION.

Engraved for the American Agriculturist.

THE FARM AND MARKET GARDEN.—III.

JAMES K. REEVE, OHIO.

While many vegetable seeds may be committed to the ground very early, and stand a considerable degree of cold without damage, it must be borne in mind that nothing will be gained by working the ground while it is wet or heavy; and that as heat is essential to germination, there must be at least some degree of warmth in the ground before the seed can begin to unfold. Commencing at the point before designated, and with radishes, as the earliest vegetable required in the market, the seed may be sown as soon as the ground is ready. Open the rows an inch deep and distribute the seed by hand at the rate of one-half ounce to each fifty-foot drill: cover two rows at once by drawing an inverted wooden rake lightly over the surface. As earliness is a chief desideratum with the gardener, and as this hand-cultivated plot is especially designed for the production of the earliest supplies, I would recommend for these twelve rows of radish some one of the early turnip-rooted kinds. The Long Scarlet Short Top is however the variety usually preferred by market-gardeners, as, by reason of their length, a bunch containing the same number of roots will make rather better an appearance than a bunch of the small round ones. But as the latter is earlier, and is more crisp and delicate in flavor, the grower cultivating for a home market—where he is personally known to his customers, and where it will pay to keep this consideration always in view—cannot do better than to grow these and so endeavor from the very start to build up a reputation for the quality of his produce. The very best radish that I have yet found is the Scarlet Turnip; the Rosy Gem and White Tipped Early Scarlet are very similar. It must be considered, however, that this crop will all mature within a brief period, and if the market is not sufficient to take the supply at once, it may be well to devote a few of the rows to Long Scarlet, which, sown at the same time, will come into market a little later and so prolong the supply.

The next twelve rows, which are for lettuce, should have only the slightest drill-mark possible opened. Sow the seed very thin and cover lightly by merely raking a little mellow surface soil over it. An ounce of seed will be more than sufficient for the entire plot. I know

of no better standard variety than the Early Curled Simpson. Cover these, and all other small seeds in this plot, as suggested in the preceding paragraph. And right here let me suggest that a good garden line is most needful, by which the rows may be marked out straight and equi-distant. As cultivation here is to be largely accomplished by means of a garden plow, the advantage of straight rows is apparent. A wrought-iron reel, with line and stake, may be had at any seed store for a small sum.

To secure an early supply of green onions, sets must be used exclusively, as the seed is so slow to germinate that the best we can hope from it is to secure marketable onions by June. Stretch the line tightly across the plot, and plant by pressing the sets well into the ground, by hand, about two inches apart. About four quarts of sets, if of medium size, will be sufficient for the twelve rows. For growing onions to market in a green state, sets of the White Globe or Silver Skin are preferable.

For beets, the drills should be opened deep enough to insure a good substantial covering of soil over the seed. Make them an inch and one-half deep, and use one ounce of seed for each fifty-foot of drill; cover and firm the ground well over the rows. The best varieties for market, earliness and quality being considered, are the Eclipse and Egyptian. Both are of the turnip-rooted sort, of good color and flavor.

Early peas should be planted two inches deep, and at the rate of one quart of seed to one hundred feet of drill. In endeavoring to select the best and earliest variety, the seed catalogues will often prove confusing rather than helpful. Almost every dealer has his own favorite "first and best." The American Wonder cannot be excelled in flavor and but little in earliness, but is hardly productive enough to meet the requirements of a market pea. The Philadelphia Extra Early probably comes as near the desideratum in quality, earliness, and productiveness as any: the tests of the Ohio Experiment Station seem to give the palm to Rawson's Clipper for earliness, this not only being ready for market as soon as any other kind, but having also ninety-three per cent of the entire crop ready to be gathered at the first picking. It was, however, found to be a very light cropper. As most of the early kinds are of dwarf habit it will not be necessary to bush the vines.

Beans are not quite so hardy as the other vegetables thus far mentioned, but as the best profit is contingent upon their earliness, it is best to make a small planting rather early and run the risk of an unseasonable frost compelling you to do the work over. The Early Mohawk, though not of the finest quality, is the hardiest of all beans, and a small planting, say six rows, of these should be made, and followed a few days later with the same of Early Red Valentine. Use one quart of seed to one hundred feet of drill, and cover two inches deep.

This will complete the planting of the smaller plot, excepting the space designed for cucumbers and tomatoes, which cannot be utilized until all danger from frost is passed. We have purposely suggested the division of the ground into two pieces, in order that a comparison might be drawn between the results of hand labor and of horse-hoeing. Also that closer attention might be secured for these earliest crops than they would probably receive if planted in the larger rows and cultivated with the rapidity incident to horse-culture and to larger areas. Also for economy of space, which is more to be considered in growing the earliest vegetables than elsewhere. If the ground is fine and moist as it should be when the seeds are put in, the mere act of covering will be sufficient to bed them properly; but should the surface be at all dry or lumpy it will be best to run a light hand-roller along the rows. This, by compacting the earth firmly about the seed where it lays, will assist in its speedy and regular germination.

How to Plant Trees.—On receipt from the nursery, the trees should be carefully heeled-in. If they are to remain several days, the tops have to be shaded. If they are very dry, tops and all should go into the trench, and the covering be made quite damp. The holes should be dug at least four feet in diameter, and deep enough to admit of planting the tree a little deeper than it stood in the nursery. The filling of well pulverized soil having a liberal amount of ground bone and ashes well worked into it is placed beside the hole. Carefully examine each tree for borers, cut back one-half of last year's growth, remove all broken limbs with a sharp knife, and coat with shellac all cuts and chafed places. All broken roots should be cut smoothly with an upward slant, and after all the roots have been dipped in thin mud, the tree is placed in the hole. Spread the roots carefully, drive a strong stake beside the tree, and fill in the soil, working it thoroughly under and among the roots with the hand. Give two or three firm treadings during the process of filling, which should reach the hight of the nursery setting, and fill the rest of the hole with a mulch of coarse hay or straw. Place a piece of woolen cloth between the tree and stake, to prevent chafing; tie firmly, and the following day give the tree a thorough watering. A. M. CLOUGH, N. H.

CULTURE OF BEANS.

JOSEPH HARRIS.

There are two or three counties in Western New York where beans are grown to an enormous extent and the farmers have become rich by their sale. There seems to be no special reason why this crop should have been adopted in this section. We have millions of acres of similar soil and climate where beans are seldom grown. If leguminous crops get their nitrogen from the atmosphere, the farms where beans are grown so largely and the vines fed out to sheep ought to be very rich. We do not learn that such is the case. In fact, it is claimed by some that beans prove to be an exhausting crop, and that the old bean growers are not making as much money as formerly.

Beans are at the present time brought from Europe in bags right into the heart of the bean-growing section of Western New York, where they are put in barrels and shipped as "New York State beans." From this it is evident that our bean growers have an established reputation which the dealers are not slow to utilize. It also indicates that beans can be grown in other places. We have known many farmers undertake to raise beans for the first time who made a failure of it. They generally plant when beans are high, and anticipating large profits put in twice as many acres as they are able to take care of. Beans *must* be kept clean. But too much hoeing and cultivating does not suit them. In other words, we need clean land to start with, or we must plant on sod turned over with a "jointer" plow immediately before planting. On such land the beans get a good growth before the weeds start, and but little hoeing and cultivating are necessary.

The bean-planter commonly used in Western New York is drawn by one horse. It makes two rows at a time, twenty-nine inches apart, and drops five or six beans in the rows in hills about fifteen or eighteen inches apart. The machine covers the beans, and the whole work is done at one operation. If there are hard clay spots which the machine does not cover completely, the work must be done with a hoe, putting two inches of fine soil on the beans. Instead of using a bean-planter many good farmers put in the beans with an ordinary grain drill, sowing three rows at a time, twenty-eight inches apart, and dropping the beans about two inches apart in the rows. They claim a larger yield, but it is, possibly, a little more work to keep them clean, and certainly more work to pull them than when planted in hills.

Beans are a profitable crop, and it seems a pity that we should ever have to import them from Europe. But let us again urge any of our readers who may plant them for the first time to select good clean land, plow carefully, and harrow and roll till the surface is as mellow as a garden. The advantage of thorough harrowing is not always appreciated.

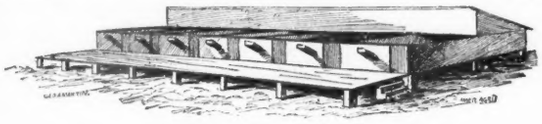
Cultivate between the rows frequently, but not too deep, with a fine-toothed steel horse-hoe that will kill every weed and leave the surface smooth and fine. Many of our corn cultivators are too coarse and leave the land too rough, so that it dries out in hot weather, and the growth of the beans is checked. The rule in regard to planting is to put in the beans as soon as possible after corn is planted.

Specialties in Flowers.—Roses, carnations, and a few other flowers appear to be popular at all times, while others have their seasons and periods of popularity, after which they return to seeming obscurity. As it is impossible for one person to grow to perfection many kinds of flowers requiring different treatment, this fickleness in flower fashions is not an unmixed evil. In raising flowers, as in any other work, it is the specialists who achieve the greatest success. The beautiful chrysanthemums, for instance, which of late have attracted so much attention, are almost exclusively grown by persons who have devoted all their energies to the perfection of these plants. Annuals have lately been much neglected, and yet they are of the easiest cultivation, and in beauty second to none. They are the flowers for everybody. They may be sown directly in the open ground, or, if the season is late, in window-boxes or hot-beds, transplanting the seedlings in proper time. Asters, balsams, pansies, and many others, afford inviting specialties. Give the annuals a chance this summer, and do not forget to plant a few seeds of the single dahlia. M. B. FAXON, Mass.

PIG PENS FOR BREEDERS AND FEEDERS.

DR. A. G. CHASE, KANSAS.

Properly constructed pens are a matter of no little importance, and much of the financial success, as well as the comfort of the breeder, depends upon them. On most farms feeding or breeding pens are chiefly conspicuous by their absence. Lots with or without permanent shelter are the most usual quarters for hogs throughout the West, in winter, and, where permanent pastures cannot be established, of the summer as well. For the best success in hog-breeding, however, a portion of the litters should come as early in the year as possible, and to raise winter pigs, even in the "Italian" climate of Kansas, we must have warm snug quarters. On many farms the hogs, cattle and horses occupy the same lot, and many valuable pigs are



A MODEL KANSAS PIG PEN.

killed or crippled by larger stock. Hence it will be found advisable on most farms to adopt a style of pens that can be cheaply constructed, will be warm and comfortable, and at the same time will be easily cleaned and cared for. The pen of this kind herewith presented is copied from those in practical use upon the thousand-acre farm of J. K. Hudson, of Jefferson Co., Kansas. Mr. H. has some twenty of these, all built at the same time. If desirable, such an one can easily be added to. The dimensions of each compartment are substantially twenty by seven feet. The rear half is roofed, and divided by sliding doors, to raise in summer, and drop in winter. The floor is of two-inch plank; the whole set upon a slope of ground. The back part is but slightly raised, while the front is two feet above the ground. There is a slant to the floor from behind forward of one or two inches, and the whole pen is quickly and easily flushed, where water is convenient. Mr. Hudson elevates water by a windmill from the well to a large tank. This tank is thirty or forty feet high, and is on the opposite side of the road, and distant perhaps thirty rods or more. The water is carried across in pipes to the pens, and the head is sufficient to easily clean the floors, and a sunk trough running through the whole length carries it off.

This system can be adapted to the small or large farm equally well, and is used by Mr. Hudson both for breeding and fattening. With little trouble, two or more pens can be thrown together. For loading the fat stock to take to market, the wagons are backed up to the front slide door. A few scraps of plank are used to make a complete "shute," so there is no lifting and straining of either animals or men. In practical hog raising or fattening business, we must keep the cost down to a minimum. If we build fancy and expensive piggeries, the pigs must pay the interest and insurance on the investment, and this, in part, has been the cause of some lamentable failures. The seven pens shown in the engraving have plenty of room to fatten fifty head. The estimated cost in Kansas is less

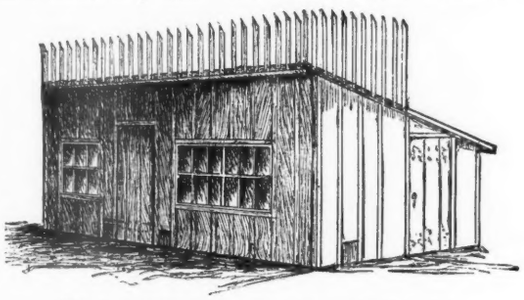


Fig. 1.—PERSPECTIVE VIEW OF POULTRY HOUSE.

than seventy-five dollars. If the farmer is carpenter enough to do his own work, the cash outlay need not exceed fifty dollars, about one dollar for each lineal foot. By using pens similar to this the manure is easily saved, and this is an item, that, while our Western farmers do not as yet appreciate it, is nevertheless one that we ought not to disregard. The manure from fifty hogs kept in this manner, and properly saved and utilized, is easily worth fifty dollars per annum upon any farm, however fertile it may already be. By putting in sluice gates the cobs can be easily kept separate if desirable. We trust that many may be led by our suggestions to adopt this or a similar plan, for we know it will be to their pecuniary benefit. With moderate outlay for repairs, it will last a life-time.

A TENNESSEE POULTRY HOUSE.

Mrs. L. J. Woodhead, Hamilton Co., Tennessee, furnishes the description and remarkably neat and accurate sketches of the poultry house and yard shown in the accompanying illustrations. The house represented in figure 1 is sixteen feet long and eight wide. The hight is eight feet in front and five feet in the rear. It is built of rough lumber, nailed on vertically, and three-inch battens. The doors are of dressed and matched boards with cleats, and furnished with locks. The house is divided into two compartments by a slatted partition across the middle, shown in figure 2. The compartment nearest to the entrance is for young chicks, and the farther one for mature fowls. The former is ventilated by a panel hinged above the door and raised by a cord running over a pulley attached to a rafter. The windows are hung on hinges, so as to open readily for ventilation. The perches are octagonal strips fourteen inches, apart, nailed to two horizontal pieces of scantling two by four inches and five feet apart,

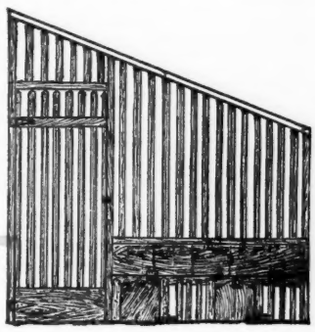


Fig. 2.—PARTITION.

hinged to the side of the house, two and a half feet above the floor. When it is desired to clean or whitewash around the perches, the free end of the frame holding them is raised to a vertical position and held there by a hook attached to a rafter. A capacious dusting-box is placed directly in front of the window of each room. The nest-boxes are placed directly against the slatted partition, projecting into the east room. There are two tiers of nests, the upper for laying hens, and the lower for sitting ones. The lower nests are provided with sliding doors on both sides of the partition. As soon as a sitting hen takes possession of one of the nests the door is closed on the west side, shutting other fowls away from her, while the door into the east room is opened. The space between the doors in the front of the lower nest-boxes is occupied by slats. This assists in ventilating the nests and converts the nest into a coop after the chicks have hatched. The doors of these boxes move in vertical slides, and each has an oval hole near the top for handling it. Drinking troughs made of old oyster cans are fastened beside each one. The upper nest-boxes are indicated by the dotted lines on the drop-door in figure 2. They are open at the opposite side for free access of the fowls, only a slat three inches wide being nailed across the lower edge to keep the eggs from rolling out. The drop-door shown in the engraving is hinged at the lower edge, and held in place by a button above. It can be let down for cleaning the nests or collecting eggs. An additional tier of nest-boxes can be made directly above those shown. The stove may be furnished or not, as desired. The ground plan of the house

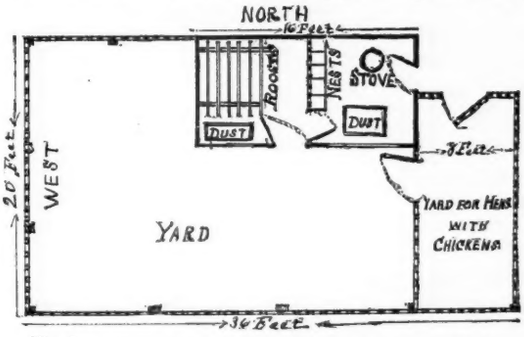


Fig. 3.—GROUND PLAN OF POULTRY HOUSE AND YARDS.

and yards is shown in figure 3. The main yard, twenty by twenty-eight feet, is for fowls, and one eight by sixteen feet for hens with broods of chicks. The whole is enclosed with a picket fence ten feet high. The house occupies the northeast corner of the main yard. The estimated cost of such a house is about forty dollars.

What is a Billion?—"C. H. M.," writing from Seattle, W. T., takes exception to a remark in a recent number as to the use of the word "billion." We employed the French term, which makes a billion a thousand millions (and which is now the generally accepted form), instead of using a million millions, which is the English form.

PLANT-LICE AND THEIR ENEMIES.—II.

MARY TREAT.

Another class of aphides are clothed in long white filaments, and when seen sailing through the air they look like flecks of down, their bodies being completely hidden from view by the white substance. When these filaments are examined under a microscope they look like crinkled wool. The Maple-leaf Plant-louse (*Pemphigus acerifolius*) is a good example of this group of aphides. This species sometimes infests our native maple trees, and it is astonishing to see how quickly a colony will be formed after one of these sailing aeronauts, with its long white streamers, takes up its abode on the under side of a leaf. Where so many can find places to fasten their beaks is something of a mystery. Each colony keeps within its own limited territory, never crawling off to adjacent leaves. But at certain periods in their lives they feel the impulse of emigration, to go where they can found new colonies, and loosening their holds allow themselves to be wafted away by the wind. Sometimes they sail long distances before alighting. Occasionally the wind is so strong that one will lose control of navigation and land on the wrong tree, but it never anchors there, and very soon sets its sails and starts again and finally alights on a maple.

Insignificant as it is alone, it soon shows its power by its wonderful increase. In a short time after it has taken up its abode the leaf will be dragged down by the united weight of the bodies of its offspring. Males are unnecessary among these creatures; generation after generation of females found colonies and carry them successfully through without the help of the other sex. The bodies of our maple-louse contain a red fluid, and when crushed they stain whatever they come in contact with, which caused me to speculate as to whether they could not be used to color with, like some of the Mexican and South American species. So I gathered several of the heavily freighted leaves and immersed them in hot water. The creatures never let go their hold, but like true martyrs died at their stakes; so I scraped them from the leaves and was surprised at the multitudes upon one leaf. I put them in the sun to dry and the wind soon wafted the white filaments away and left the naked bodies, which look very much like cochineal. I still have the dried bodies, and some day intend to make the experiment of dyeing with them.

The Root-lice are far more destructive to vegetation than those which inhabit the stems and leaves. Sometimes the flowering plants in our gardens, especially in sandy soils, have a sickly look for which we can see no cause. One summer, just as my asters were coming into bloom, they began to wither and wilt, and with all the care I could bestow upon them they would not revive. It seemed a mysterious dispensation which I was unable to solve, until one day, while puzzling over the matter, I noticed some small ants going down into the ground by the side of one of the stems, and others coming up with well-rounded abdomens. This was before I knew anything about root-lice, but the ants had given me a clew to the trouble, and now with a small knife I carefully followed one of the subterranean galleries by throwing aside the earth until I reached the aster roots, where I found multitudes of dark or dun-colored aphides clinging to the roots. There were the ants' cows in nice underground stables which the little ant proprietors had made by excavating around the roots of the plants to enable them to go around among their herds to obtain the sweet fluid, or honey dew as it is sometimes called, which the aphides secrete. The ants are very fond of this fluid, and were naturally much excited on having their stables broken into, and their cows exposed; they rushed about with their animals in their mouths, trying to find places to hide them. Every aster in my garden proved to be infested with these lice, and a sorry looking lot they were. I carefully washed the roots of some of the more promising-looking plants and reset them in fresh soil, but it was no use, they never recovered.

Swarming Boxes.—During the swarming season every beekeeper should provide himself with a "swarming box." This saves an immense amount of labor, besides obviating the damage often committed on valuable fruit trees and vines by cutting and mutilating them in order to detach swarms therefrom. This box may be made ten by ten by fourteen inches, inside measurement. It should be perforated with many holes, three-quarters or one inch in diameter; a pole eight or ten feet long should be fastened through the center of the box, so that it may balance. After a swarm has pretty well settled on a branch of a tree, the box may be pushed up into the cluster of bees, when they will ordinarily take to it and occupy it. If they should not do so readily, the box, being open at one end, may be held under the swarm, when by giving the limb a jar a portion of the bees become dislodged into the box. The remainder will readily alight on the same, and all may be carried to the stand.

EARLY MORNING IN THE ALPS.

The traveler in the Swiss Alps meets with a very primitive husbandry. In a climate where the winters are severe and long, the farm-houses are clustered in some sheltered locality, for social reasons, while their few fields and ample pastures are at a long distance from the farm-houses. One sees upon the flanks of the distant mountains numbers of what appear to be small pens. Upon inquiry, he learns that what the great distance has dwindled into pens, are the summer farm-houses of the people of the village. When the grass is in good condition, whole families, with their cattle, resort to these distant pastures, and during the summer months are engaged in making the peculiar "Swiss cheese." The writer was in those regions at the close of the summer season, and met with many families on their return to their village homes. Cattle, men, women, and children were in the procession, each person carrying some household utensil, while the men bore, upon a peculiar rack carried upon the shoulders, a staggering load of cheeses; these were also loaded upon donkeys, for the descent. Besides cattle, these primitive Swiss farmers have small flocks of very coarse sheep, and flocks of excellent goats, which are noted for their milking qualities. All the various sheep and goats owned in the village are gathered into one flock, and sent out, in charge of an old man as a herder, to some not distant pasturage. The artist, Max Lebling, has chosen for his picture, presented on the opposite page, a scene at early morn in one of these Swiss villages. These are what is called in Texas a mere "huddle" of houses, but of exceedingly picturesque architecture. The herder sounds his horn, to call together the animals from the shelters of their owners where they have passed the night, and the flock will soon go afield, watched by the herder and his vigilant dogs. Primitive and uneventful as is the life of these mountain farmers, they appear happy and contented; they are certainly healthy, and also intelligent, for wherever there is one of these farm hamlets, the school-house is not far distant.

Wheat of the United States.—The recent wheat crops, and proportion of each in the hands of farmers on the first of March of the following year, are thus reported by the Department of Agriculture, and were kindly furnished us by J. R. Dodge, the Department statistician:

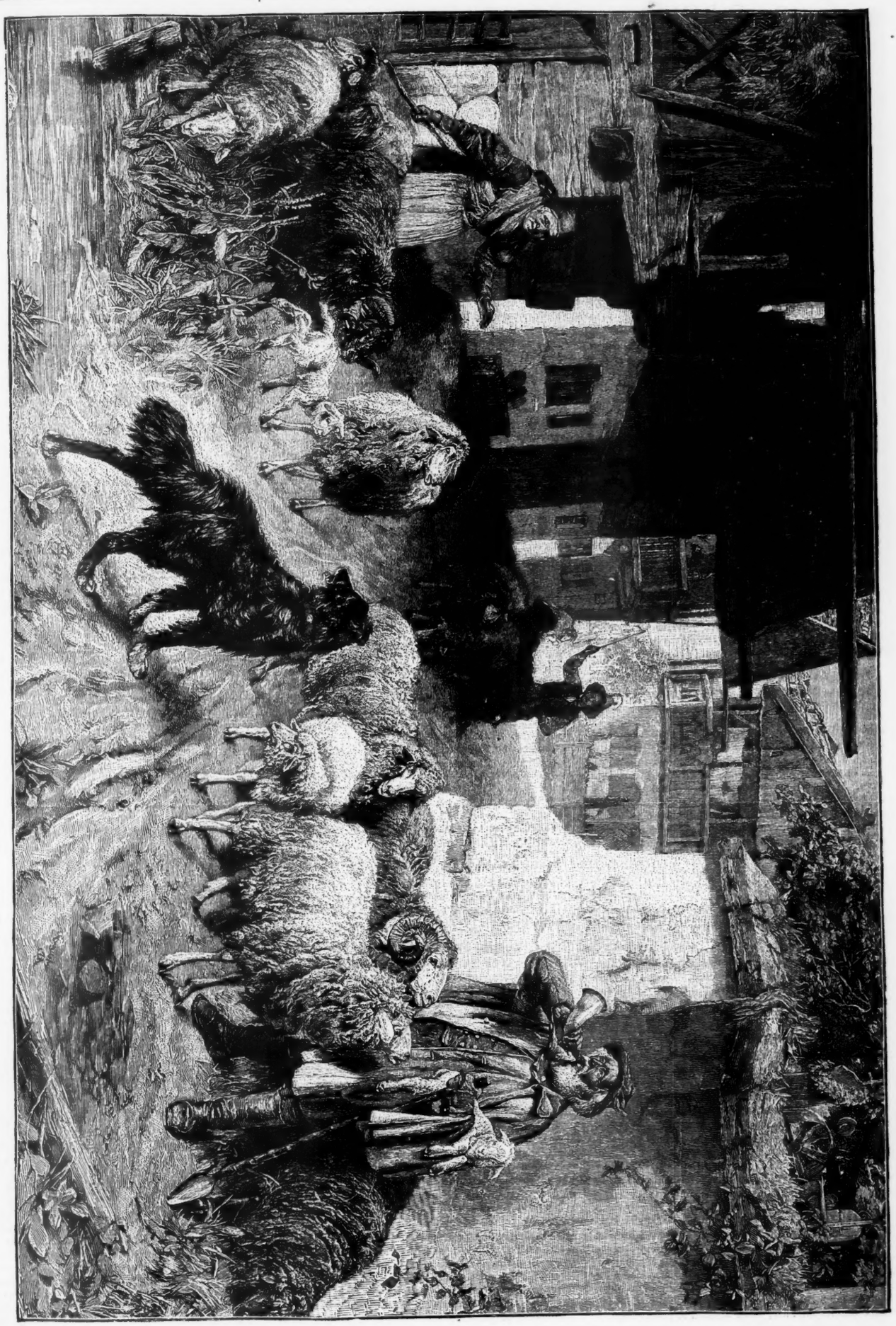
Years.	*Crop of previous year. Bushels.*	*In farmers' hands, March 1. Bushels.*	*Per cent.*
1888	456,329,000	132,000,000	28.9
1887	457,218,000	122,000,000	26.7
1886	357,112,000	107,000,000	30.1
1885	512,763,900	169,000,000	33.1
1884	421,086,160	119,000,000	28.4
1883	504,185,470	143,000,000	28.5
1882	383,280,090	98,000,000	25.5
1881	498,549,868	145,000,000	29.1

The distribution of the last crop is thus returned:

	Bushels.	*Bushels.*
Visible supply, July 1, 1887		34,060,000
Crop, 1887		456,000,000
Consumption, July, to February 29, 1888	187,000,000	
Seed for winter wheat	34,000,000	
Exported, July 1, to February 29, 1888	89,000,000	
Visible supply, March 1, 1888	38,000,000	
In farmers' hands, March 1, 1888	132,000,000	
Totals	480,000,000	490,000,000

There is still uncounted an invisible element, always present, but not always in the same proportion, wheat en route, in mills, in flour, in course of distribution. This is larger in March than in July, after a twelve months' drain of the crop supply. The annual estimates of production follow, as tested by records of distribution in the year following in each case. Production exactly tallies with distribution so closely that every statistical Thomas will assume the result a marvelous guess or a strange coincidence.

Year.	*Production. Bushels.*	*For food. Bushels.*	*For seed. Bushels.*	*Exportat'n Bushels.*	*Total distribution. Bushels.*
1880	498,549,868	242,086,655	56,563,530	186,321,514	484,971,699
1881	383,280,090	235,249,812	55,215,573	121,892,389	412,357,774
1882	504,185,470	255,500,000	52,770,312	147,811,316	456,081,628
1883	421,086,160	259,500,000	54,683,389	111,534,182	425,717,571
1884	512,763,900	265,000,000	55,266,239	132,570,367	452,836,606
1885	357,112,000	271,000,000	51,474,906	94,565,794	417,040,700
1886	457,218,000	277,000,000	51,528,658	153,804,970	482,333,628
Total	3,134,195,488	1,805,336,467	377,502,607	948,500,532	3,131,339,606
Average	447,742,213	257,905,210	53,928,944	135,500,076	447,334,229



EARLY MORNING CALL IN THE ALPS.

Engraved (after Max Lebling) for the American Agriculturist.

OUR BASKET

Clubs can at any time be increased by remitting for each addition the price paid by the original members; or, a small club may be made a large one at reduced rates, thus: One having sent 5 subscribers and $6.00, may afterwards send 5 names more and $4.00, making 10 subscribers at $1.00 each; and so for any of the other club rates. Subscriptions can begin at any time, as every number of the paper is complete in itself.

Bound Copies of Volume 46 (for 1887), uniformly bound, in cloth, gilt backs, will be furnished at this office for $2. If sent by mail, $2.30. We can usually supply at same rate any of the previous volumes, that is, volume 16 to 46 inclusive.

Destroying Willows.—F. B. Helzer, Lake Co., Colorado, asks us for some method for eradicating willows, easier than to grub them out. If they are cut down close to the ground, when in full leaf, and the sprouts kept down thereafter, the roots will soon die out.

Quack Grass.—J. R. Genista, Racine Co., Wis. Only those "old farmers," who believe that chess originates from wheat, believe that Quack or Couch-grass originates from Blue-grass. None of these advocates of such transformations ever bring proofs of their assertions.

Cotton-Seed Meal.—Louis De la Croix, Rockingham Co., New Hampshire. Several analyses of decorticated cotton-seed indicate that in one ton of it are 134.6 pounds nitrogen, 60.6 pounds phosphoric acid, and 35.8 pounds potash. This would show the material to be very rich in manurial constituents.

Soil for Window Plants.—C. Buck, Weber Co., Utah, writes us that he recollects that his father used to prepare his soil by placing it in a pan, and heating it so hot that worms, insects, etc., would be killed. When cool, this baked soil was used for potting, the same as other soil.

Timber Trees.—F. D. Grant, Davis Co., Utah. White ash may safely be transplanted either from the seed-bed at a year old, or from nursery rows the second or third year. Taking up young seedlings in wild thickets is likely to result in failure, as the plants are not as well provided with roots as those grown in nursery rows. The European Hornbeam (*Carpinus betulus*) is scarcely worth raising, either for timber or shade, in this country where there are so many better trees.

Fertilizing Corn in the Hill.—Christian Caseman, Sullivan Co., Pennsylvania, writes us that he has been accustomed to apply fertilizer to corn by dropping it in the hill, covering it with earth, and then planting the corn above it with a hoe. He desires to use a mechanical corn planter. We believe there is at least one planter so constructed as to drop the fertilizer in the hill below the seed, but do not have the address of the manufacturer.

Trouble with Cream.—Geo. Rasecker, Dauphin Co., Pennsylvania. The usual cause for butter failing to "come" in winter is that the cream is too cold. If you keep your cream warm enough, "but the butter will not come after hours of churning," there must be something wrong with it. This depends so largely on the feeding, management, and condition of the cows, and the care and treatment of the milk and cream, that no intelligent opinion can be formed without a knowledge of all the facts. Sometimes the churning is facilitated by diluting the cream with water at the temperature of sixty-five to sixty-eight degrees Fahrenheit.

Salt as a Fertilizer.—E. R. Dyer, Barbour Co., West Virginia, writes us: "I have plowed a meadow that I want to re-seed in timothy. I think of using salt as a fertilizer. Will it do? How much should I sow to the acre?" The testimony as to the value of salt as a fertilizer is very uncertain and conflicting. Much depends upon the kind of soil and the location. Some think that its chief use, when applied to grain crops, is to aid the plants in taking up silica, and thus strengthen the stem. Others think it aids the plant in retaining moisture. The widely different quantities applied, show the uncertainty attending it. It is advised to use all the way from three to sixteen bushels to the acre.

Struck a Regular Bonanza.—Wm. W. Fidler, Kings Co., Washington Territory, writes us: "Your photo-etching Christ before Pilate, just received, constitutes a splendid premium in itself, and supplemented as it is by the other engravings and valuable books, I feel as though I had struck a regular bonanza in subscribing for the *American Agriculturist*. I take three weekly papers and each of them has an agricultural department. The question has often occurred to me, why can't these alleged newspapers leave the agricultural matters to periodicals that make a specialty of them. I am sure they would greatly oblige their readers if they did so."

About the Nettle.—"A subscriber," La Fayette, La., writes us: "The nettle is known to possess the quality of producing a stinging sensation when it comes in contact with the skin. But if handled while inhaling or holding the breath, no pain follows. A rational or scientific explanation of this strange fact would doubtless interest numerous readers of your valuable periodical." We should prefer to have the alleged "strange fact" substantiated by reliable evidence before we endeavor to account for it. Has our correspondent ever tested the matter?

Lilac and Syringa.—O. Nilsson, a subscriber in Iowa, ordered of a nursery, *Syringa vulgaris*; he was sent two bushes "called lilac," and he wishes to know "the botanical name of lilac." So far as names go, the nurseryman was right, the botanical name for the plant popularly called "lilac" being Syringa. By a singular confusion of names, the plant, one of the common names of which is "Syringa" is a very different one, and is botanically, *Philad-lphus*, often called "Mock-orange," a desirable ornamental shrub. If you order *Philadelphus* or Mock-orange, you will no doubt get what you have known as "Syringa."

A Well in the Cellar.—James L. Conklin, Fairfield Co., Connecticut, writes us that he has a fine well of water about the center of the spot where he finds it desirable to build a new house. He wants to save the well, but it will not do to have it open in the middle of a cellar. It might be covered with a flat stone, laid in cement, level with the cellar bottom, with a galvanized iron pipe fitted through it and connected with a pump. Or a wall of brick or stone laid in cement mortar, and inclosing the well, can be carried up to the floor above. In any case it should be carefully protected from contamination by drainage from the cellar.

Burning Lime.—H. C. Phenicie, Bourbon Co., Kansas. There are several very excellent styles of lime-kilns. They are arranged so that the limestone is fed in at the top of the kiln, and the lime drawn from below as it becomes sufficiently burnt. This goes on continuously without checking the fire. The patents on many of these have expired, and any one is at liberty to use the devices. Before adopting any particular device, however, it would be advisable to institute inquiries at the U. S. Patent Office, and ascertain whether a patent on it is still in force. A small fee at first is better than expensive litigation afterwards.

Managing Manure.—A. W. Cohen, Iredell Co., North Carolina. For composting with stable manure swamp muck is the best material. Make a bed of the muck, three or four inches deep, then a layer of manure, another of muck, and so on, alternating to the top. Acid phosphate, kainit, and other commercial fertilizers are better applied separately than put in the compost heap. Keep the heap moderately wet, and turn over every few weeks with a fork or shovel. Manure from the henroost may be mixed in with the stable manure, but on no account put wood ashes in contact with either. They drive off the ammonia.

Fruits for British Columbia.—G. W. Besbe, New Westminster, B. C., desires information as to varieties of fruit best adapted to his climate, which he describes as not so cold in winter as New York State, and not so warm in summer as Western New York. Fruit culture in that vast region is yet in its experimental stages, and, in the selection of varieties, the fruit grower should be guided largely by the experience already obtained. In the absence of such guides we should recommend a trial of these: Apples—Red Astrachan, Gravenstein, Baldwin, Northern Spy, Fall Pippin, Roxbury Russet; Pears—Bartlett, Winter Nelis, Seckel, Anjou, Bosc, Lawrence; Plums—Green Gage, Columbia, McLaughlin; Cherries—Governor Wood, Black Tartarian, Napoleon; Grapes—Worden, Niagara, Brighton; Strawberries—Charles Downing, Sharpless, Cumberland; Blackberries—Kittatinny, Snyder; Raspberries—Cuthbert, Marlboro; Currants—Cherry, Fay's Prolific.

Seeding to Clover.—John Alfred Macdonald, Prince Edward Island, writes us that he sows red clover seed on his spring wheat, but the plants grow spindling and drawn, and die out when the wheat is cut. The trouble seems to arise mainly from the fact that the season is so far advanced when the ground is ready to be prepared for spring wheat that the clover has no chance. Clover must be sown very early to succeed. We would suggest a change in the system. Plow the land early in September, and seed to grass then. In spring sow the clover seed before frost is out of the ground, or on the snow. Two good crops of hay can be taken off, and a clover sod left for turning under afterwards.

Wire and Picket Fence.—Rev. James C. Forsyth, Orange Co., New York, writes us that the wire fence described on page 106, in the March number of the *American Agriculturist*, "is covered by patent exactly as described," and that the said patent is now owned by his friend and former parishioner Mr. Rappelye of Seneca County, New York. Of course, if this wire and picket fence is patented, as is here asserted, those who make use of it are liable for an infringement of the patent, and our readers are cautioned in regard to it. We are informed that the method of fence making described by Mr. Teeters in the March number is in quite general use in Illinois and other Western States. Machines for weaving the wire and making the picket fence have been advertised in this paper.

Extending the Milk Route.—The milk supply of New York has heretofore been drawn from a region within about one hundred miles of the city. The limits have recently been extended, and the central and western counties along the southern borders of the State are now drawn upon. If the experiment now making in counties two hundred and fifty miles away proves successful, counties three or four hundred miles distant will be tapped. The milk is brought in refrigerator cars. Some of the largest milk producing counties in this State never have sent milk to the metropolis. They are large producers of butter and cheese. The extension of the milk route will prove a source of profit to the farmers.

About Sumach.—The imported sumach is a very different species from ours, which is a native shrub, *Rhus glabra*, collected from the wild plants. The European is *Rhus Coriaria*, and is cultivated extensively in Sicily. It is a low shrub, which in the third year after planting gives an annual crop of leaves and small twigs. The quality is greatly affected by the soil; that upon a poor soil being greatly superior to the product of rich soil, and that produced in Sicily is much better than that grown in Continental Italy. Twenty-five or thirty years ago, before the Department of Agriculture was established, our government, through the Patent Office, imported plants from Sicily for distribution in some of the Southern States. The war came soon after, and we have heard nothing about them since.

An Asiatic Pacific.—They are building a "Pacific railroad" in Asia, or rather across Europe and Asia. That is to say, the line crossing Russia from east to west, and in reality connecting the Atlantic Ocean with St. Petersburg and Orenburg on the River Ural and the Siberian frontier, is to be pushed across Southern Siberia to the Amoor River. Another line is from the Caspian Sea east along the border of Persia, and so towards the British possessions in India, with a possible connection to the northward with the Siberian line. These roads are not merely military; they have also a commercial aspect and are interesting to us as possible factors in the distribution of the trade of China and the East, which has been for generations the coveted possession of all the enterprise and daring of Western Europe, and in late years of the United States.

A Too Fertile Soil.—A. J. Stedman, Jefferson Co., Ohio, has some "bottom land" which produces an abundance of straw and stalk, but very small heads and ears. He asks about the use of lime on his corn crop the coming season. Probably his is a soil too full of vegetable matter for a grain crop of any kind, and a grass crop would be more suitable. As to the use of lime, it is applied to such soils in quantities all the way from fifty to one hundred and fifty bushels to the acre; it is not put on with a drill. The freshly burned lime is placed in one or more heaps and covered with several inches of earth. In these heaps it will slack slowly and thoroughly. When in proper condition, it is distributed broadcast from a cart. It should be spread after plowing, and only be harrowed in, as it is desirable to keep it as near to the surface of the soil as possible.

Millet Hay.—C. M. Smoke, Richardson Co., Nebraska: Millet hay is not injurious to cattle if it is cut early enough. Millet or Hungarian grass, when suffered to stand until seed is even partially ripe, becomes hard and woody. They should be cut before the blossoms begin to fall.

Sugar Beets for Cows.—Fred. Daab, St. Clair Co., Illinois. Sugar beets will do well on any land that will bear corn. They are very good food for cattle, but should not be fed to milk cows when first harvested. But the adoption of the silo in the dairy regions has greatly supplanted the use of roots as feed for stock. The crop is more easily raised, harvested and stored than beets or other roots, and heavier crops can be obtained from the same land.

Compost Heaps.—J. W. F. Thomas, Carroll Co., Indiana: A compost heap is made of alternate layers of manure and swamp muck, sods, or other absorbents, the thickness of the respective layers depending upon the nature of the materials. Those of fresh stable or hog-pen manure, should not be more than four or five inches with three inches of muck between. The heap is to be shoveled over a few weeks after it is made up, and a few times thereafter. This will prevent fire-fanging.

The Needs of South Carolina.—G. J. Redfearn, Chesterfield Co., South Carolina, writes us: "We want more brains and more capital. Land is cheap, water plentiful, and climate unsurpassed. Our people are peaceable and law-abiding, and will give a hearty welcome to all who shall come for the purpose of bettering the condition of the country, as well as their own. We have limited railroad facilities as yet, but several schemes in that direction are now being agitated with reasonable prospects of success. As soon as these lines shall be built, real estate will advance rapidly."

Lice on Cabbages.—First Lieutenant Wm. Paulding, Fort Crawford, Col. A strong infusion of tobacco is generally effective in clearing cabbages and other plants of aphides. It should be applied at frequent intervals before the cabbages begin to head. If that fails, fumigation with tobacco smoke might be tried, each plant being covered by a small tent-shaped canopy, or paper, to confine the smoke. The latter remedy would involve more labor than would be profitable to a truck farmer, but in a post garden, where there are plenty of willing hands, this objection would probably not hold.

Fertilizing a Sandy Soil.—George O. Gridley, Kankakee Co., Illinois. On a sandy loam, with sandy and gravelly subsoil, planted to strawberries, commercial fertilizers should be applied in small quantities and frequently, to avoid leaching. For green manuring cow peas will doubtless be the best of anything. Rape, buckwheat, and many other crops which act favorably on heavy soils would not be advisable on very light ones. They act mechanically in loosening the soil, but add little, if anything, to its fertility, except to restore what they have already taken out.

An Asparagus Bed.—G. W. Boving, Fairfield Co., Ohio, has a fifteen year-old asparagus bed, one-half of which is satisfactory, while the rest yields small shoots, hardly worth cutting. The bed has been well-manured, and salt has been applied. The bed has from time to time been raised by adding rich soil. Apparently these poor plants were stunted while young, probably by cutting from them before they were strong enough. After what has been done, it is hardly to be hoped that a remedy can be found, and it would be easier and cheaper to set out a new bed. If anything will help the poor plants, probably leaving the shoots uncut for several years may do it.

Milk Supply of Cities.—Otto Rohland, Sullivan Co., New York, asks us whether it would not be possible for the States of New York, New Jersey, Delaware and Connecticut, if they made their utmost effort to produce milk, to supply the cities of New York and Brooklyn, so that their inhabitants need not have resort to condensed milk. The use of condensed milk in New York City arises not from a scarcity of the fresh article, but on account of its convenience and better-keeping quality. The surrounding region supplies milk enough not only for the daily consumption of New York and adjacent cities, but also for the use of the condensing factories, a large part of the latter being shipped to other parts of the country.

Corn Cobs—Wheat Rust.—Felipe P. Bolde, Quaretaro, Mexico. Corn cobs alone possess very little nutritive value—not enough to pay for grinding, and no animals will eat them in their natural condition. But when ground with the corn, the cob meal serves to separate the particles of corn meal and expose them to the action of the digestive fluids in the animal's stomach. Recent experiments by Prof. Sanborn and others showed very favorable results from feeding this kind of meal, ground very fine.—Rust in wheat is caused by a parasitic fungus, which creeps through the sap-vessels, ultimately bursting them. This growth is promoted by atmospheric influences, and no positive remedy or preventive is known.

Fish Culture.—J. N. Shoemaker, Franklin Co., Pa., owns a creek and land on which is a pond of about ten acres and from eight to twelve feet deep. He desires information whether fish culture would pay, and also what rights he has as regards catching the fish. Such a pond might profitably be stocked with fish, and no one would have a right to catch them without your permission. If the stream is reasonably clear, with rocky bottom, bass or pickerel would do well, but probably German carp would be the most profitable of any. Special arrangements to guard against the loss of fish by floods would be necessary. Trout, bass, and pickerel only are recognized as game fish by the laws of Pennsylvania. These can be taken only by hook and line, but the restriction does not apply to any other kinds of fish.

Preventing Smut on Grain.—G. W. Smith, Lancaster Co., Neb. In the use of lime for preventing smut in wheat it is best to first soak the grain in a solution made by dissolving two pounds of sulphate of soda (Glauber salts) in three gallons of water. When the soda is all dissolved, sprinkle the heap of wheat with the solution, turning the grain over until every kernel is wet, then dust the whole with dry lime recently slacked, stirring the grain until it is well coated with the lime. In using blue vitriol (sulphate of copper) dissolve one pound in each two gallons of water required for thoroughly soaking the grain. After soaking for twelve hours, drain off the vitriol water and dry the grain by dusting with gypsum or ordinary lime. Seed corn may be treated in the same manner.

Sheep for a Timber Fallow.—Dr. George H. Rhoads, Monroe Co., Pennsylvania. Rough land from which timber has been cleared off, and which is now covered with a growth of briars, ferns, and underbrush, would afford very indifferent pasturage for sheep. Their fleeces become so torn and burry in such places as to be nearly valueless. It would be far better to reforest such land by allowing the best part of the undergrowth to grow up, and supplying any deficiencies by planting the most desirable kinds of trees. The amount of forage required to winter one hundred sheep depends largely upon the breed. Merinoes will winter on six to eight hundred pounds of hay or its equivalent per head; Leicesters and Cotswolds on ten to twelve hundred pounds each.

Marketing Radishes.—J. O. Connor, Madison Co., Tenn. Radishes are made into bunches of six or nine, according to the season. The long kinds are made into flat, fan-shaped bunches, and the round kinds into round ones. For washing the long kinds, a board is kept in an inclined position in a tub of water, keeping its lower end down by a weight; the bunches are laid upon this board and cleaned by the use of a soft brush; the round kinds are washed by shaking the bunches in the water. There will be yellow or broken leaves, which should be removed by the buncher. The bunches are packed tightly, so that they will not get bruised, in barrels which are well-ventilated by holes in the bottoms and sides. Radishes are not suited to long transportation, and those sent to distant markets should be packed in well-ventilated, slatted crates. Drain before packing.

Farming in Kansas.—Mrs. W. W. Wilson, Anderson Co., Kansas, writes us: "As to soil, we have almost all kinds, from the poorest stony ground which will only grow mullein and other weeds to the richest sandy valley loam, which, with sufficient rain at the proper season, will produce grand crops of wheat, corn, or almost any other staple crop. This is a freaky country. We often have a superabundance of rain at the time for seeding; then when the rain is needed to grow and mature the crops, it is withheld, and thus many a hope in the heart of the Kansas farmer has been crushed. Still, Kansas farmers have plenty of pluck, for if they fail one year they only try harder another. If one thing fails on account of drouth or too much rain, another may withstand it. Also a diversity of crops. One man may try several kinds—say wheat, oats, corn, rye, flax, potatoes, etc. If the season is poor for one, it may be good for another. The more the soil is worked the better. This will hold good with all kinds of crops. The ground must be well prepared by plowing and repeated harrowing, to receive the seed; then thoroughly cultivated after."

Animal Ailments.

Mange.—"Farmer," Platte Co., Nebraska. An excellent ointment for mange or itch on domestic animals may be made by thoroughly mixing two ounces of flowers of sulphur, three drahms of chloride of lime, and six ounces of lard. Apply to the affected parts, rubbing it in with a rather stiff brush.

Cold Horns.—"Subscriber," New Jersey. Coldness of the horns of an animal does not indicate any special disease. Any variation in the circulation of the blood from a cold or other slight derangement may cause a lowering of the temperature, without otherwise affecting the health of the animal. Unless the animals show any more decided evidences of disease, we should not advise to give medicines. Keep them in warm, comfortable quarters, and give nourishing food.

Warts on Cow's Teats.—Wm. Blake, Fulton Co., Ga. Warts are of frequent occurrence on young animals, and do not indicate any general disease. They are merely the result of over-nutrition of some tissues, causing an abnormal development. Warts with a distinct neck may be readily removed by tying a ligature around them. Flat warts have to be cut off close to the skin, and by cauterizing the raw surface with lunar caustic, nitric acid, or some other strong caustic, they will soon disappear.

Bloody Milk.—W. Keely, Kanawha Co., West Virginia, has a seven year old cow, not with calf, which gives two gallons of milk per day. The milk contains bloody clots occasionally, and information is desired as to the cause of this condition. Inflammation of the udder, mammitis, is the most frequent cause of bloody milk, but it may also be the result of various other conditions, as is probably the case in this instance. Violent jerking of the udder, a blow, a cold, too rich food, or the eating of some acrid plants may cause it. With some heavy milkers, which are subject to it occasionally, the cause may be overexcitement of the secretory apparatus of the udder. Cooling purgatives, followed by nitre, together with rest, and frequent, careful milking will generally effect a cure.

Lump in a Cow's Udder.—A. G. Bryan, Crawford Co., Ohio, writes us: "I have a fine full-blooded Jersey cow, about seven years old. She dropped her calf on the 11th of November, gives from eleven to twelve quarts of milk per day, but three-fourths of this quantity comes from the right side of the udder. There seems to be a small 'lump or cake' on the left side which is about half way up in the bag; the teats are all right, and milk freely. What is the cause, and what the remedy?" In all probability the cow has at one time received some injury which, although it was not observed then, was sufficient to result in the existing indication. We would recommend the external application of a mixture of one part of spirits of camphor and seven parts of glycerine; if this has not the desired effect, iodine ointment should be tried.

Kennel Lameness.—R. S. L., Philadelphia, Pa. This is a common disease in dogs, in Europe, due to frequent and constant exposure to cold and wet; it is often produced through damp, uncomfortable kennels. Dogs that are exposed to varied temperatures are very liable to this form of rheumatism. There is generally considerable fever, shivering and dullness present, and stiffness and soreness in one or both shoulders. The animal shows an indisposition to move, and experiences pain if the hand passes over its shoulders. In long standing cases, power of movement of the forequarters is almost lost, and most chronic cases are incurable. The treatment most advisable is to give the animal a warm bath, and after thoroughly drying, rub the affected part well with a liniment composed of equal parts of spirits of turpentine, spirits of hartshorn, and laudanum. The bowels should be freely acted on, and the dog kept in a warm, dry place, free from draughts.

Staggers.—L. F. Moore, Marion Co., Oregon. This disease in horses, properly termed vertigo, is caused by some disorders of the brain, or spinal cord, and results frequently from pressure of the collar upon the jugular veins. When the attack comes on, the animal shows indications of uneasiness, twitching of the ears, and shaking of the head; then the eyes become staring and bloodshot, the animal staggers, darts forward in a blind condition, and drops into a convulsive state. This occurs mostly when the horse is driven fast uphill in a tight-fitting collar. So soon as the first sign of uneasiness becomes apparent the horse should be stopped, the collar pushed forward, the eyes covered, and cold water, or ice when this is available, applied to the head and neck. If, after the animal has recovered the journey has to be resumed, a wet sponge should be placed on the top of its head, between the ears. Horses subject to staggers should have a rather loosening diet, be pastured as much as possible, and should not be worked in hames-collars.

A FARM OR SUBURBAN DWELLING COSTING $2,000.

GEO. A. MARTIN.

The accompanying engravings present a perspective view and plans of a cottage which may be built for about two thousand dollars. The extreme length from front to rear is thirty-five feet, the greatest width is twenty-seven feet, and the posts are eighteen feet. The cellar is seven feet high in the clear, and extends under the dining-room and parlor. The front entrance of the house is sheltered by a small porch, but for a suburban or seaside situation it would be well to add a broad veranda extending across the entire front. A perspective view of the house is given in figure 1. The first story, figure 2, is nine feet high in the clear. The stair hall communicates with every other room on the floor. Half way up the stairs is a landing which is also reached by a short flight from the kitchen. Immediately over the landing is a small window with a border of stained glass. The hall is also lighted by a narrow window of clear glass beside the door. The newel, handrail, and balusters are of cherry or ash, oiled on the grain. The hall communicates with the parlor by a broad curtained opening. One corner of the parlor is occupied by an open fireplace. The space above may be provided with an over-mantel for the reception and display of vases and bric-a-brac. The two front angles of the parlor are truncated sufficiently to admit full-sized windows. This makes the entire front in effect one broad bay window, and relieves the room from all stiff right-angularity. The broad opening between the parlor and the dining-room may be closed by sliding doors, as indicated in figure 2, or if preferred, by a portière. The dining-room is of size and proportions for a table seating twelve persons at once. It has, besides, a cosy corner, but if utility is the main consideration, the window and seat indicated in the plan may be omitted and the corner converted into a closet instead. Access to the kitchen is had through the pantry, which affords increased security from the odors of cookery. The kitchen is wainscoted to the hight of three feet, with narrow matched pine boards, surmounted by a beaded heading. Under the short stairway is a closet for the storage of iron ware. The back door may open upon a small stoop, or a lean-to for the storage of fuel, etc., may be added to the rear of the house. The second story, figure 3, is eight feet high in the clear, finished throughout in hard wood or yellow pine as preferred. The spacious front chamber is provided with an open fireplace, and a large closet. Two smaller rooms are warmed by stoves. The bath-room is situated in the middle of the house, where it is protected from frost, and is directly over the kitchen stove, which is furnished with a water-back, whereby warm water may be supplied to the bath-tub. The bath-room is becoming more than ever recognized as a desirable feature of every well-ordered farm dwelling. Surely if there are any for whom it is not only a luxury but a necessity, it is those who are daily exposed to the heat and dust of farm work. A small closet beside the chimney will be found very useful for the storage of towels and other articles. The house is built with a balloon frame, the two-by-four inch studding being doubled at the angles and openings. The outside walls are covered with surfaced hemlock sheathing laid on diagonally. On this is nailed sheathing paper well lapped. The first story is clapboarded, the second shingled, and the gables are covered with vertical siding of dressed and matched pine with panel strips. The roof is covered with shaved pine shingles.

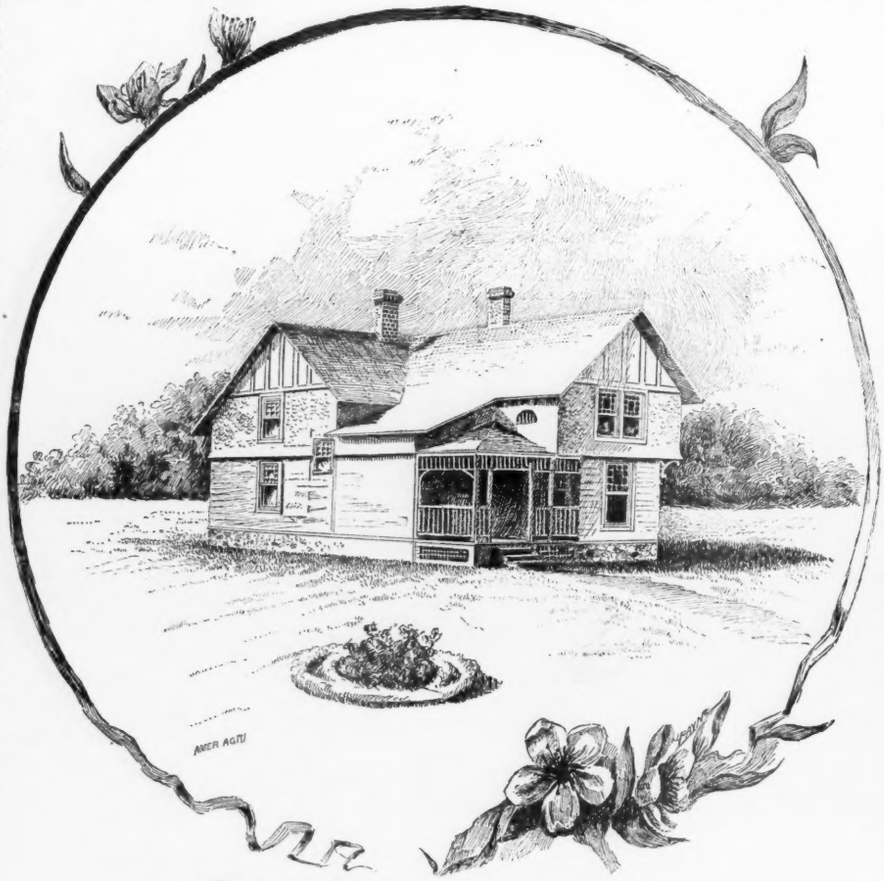


Fig. 1.—PERSPECTIVE VIEW OF SUBURBAN DWELLING.

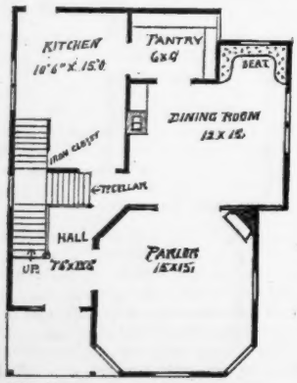


Fig. 2.—PLAN OF FIRST FLOOR.

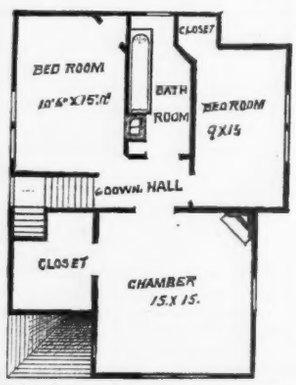
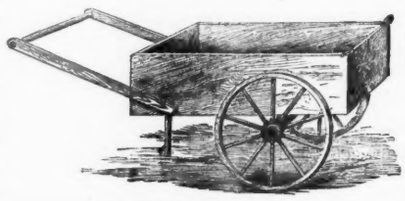


Fig. 3.—PLAN OF SECOND FLOOR.

A FARM HAND-CART.

Our illustration shows a very convenient form of hand-cart, the wheels of which are taken from a worn-out sulky cultivator or similar implement. The axle is of white oak, elm, or other tough hard wood. The box is of inch lumber, three and a half feet wide and four and a half long. The bottom rests directly upon the axle. Six inches from the front a cleat is nailed across the bottom for the double purpose of strengthening it and of supporting a leg to hold up the cart when at rest. The handles are securely nailed to the sides of the cart body, as shown in the engraving.

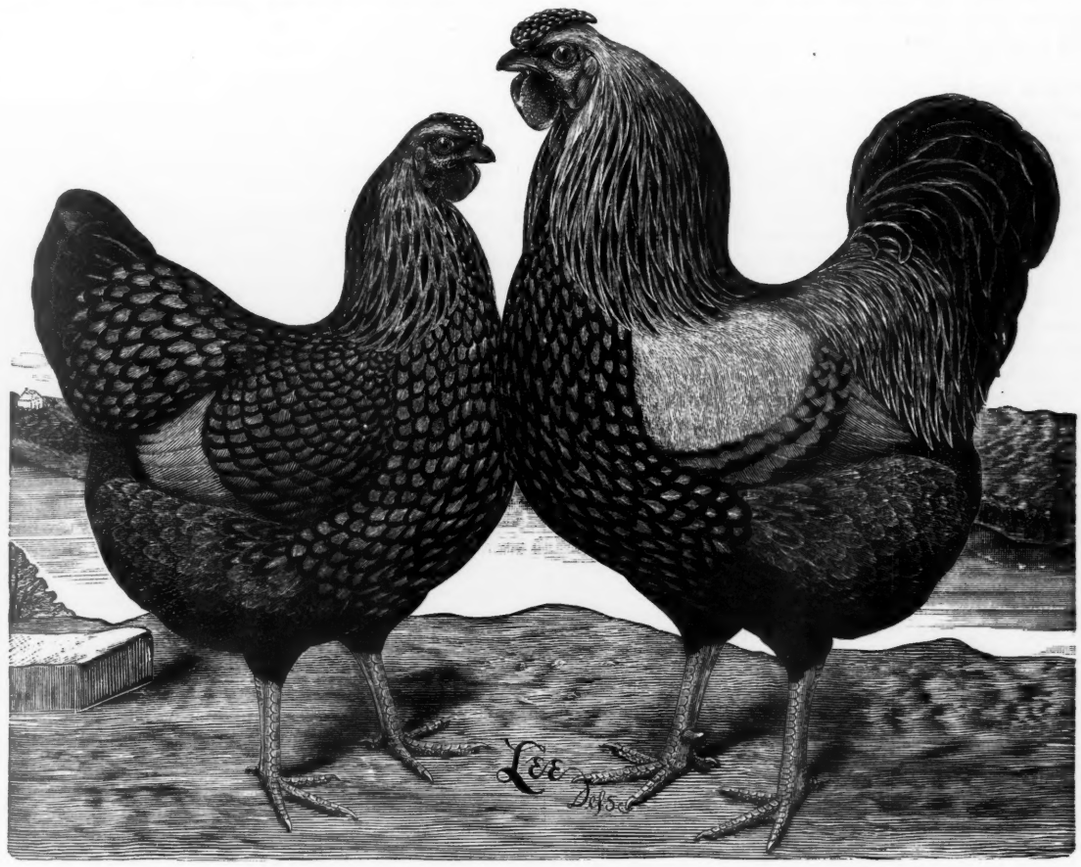


A USEFUL HAND-CART.

The Best Breed of Hogs.—To the young breeder just starting out, we would suggest that his farm, or style of farming, may have much to do in determining what kind of hogs is most profitable for him to keep, and I would offer these suggestions, that will probably not be contradicted. If you have a small place near some market, following truck farming, and wish to keep a dozen or twenty pigs to consume the vegetable refuse, keep the Essex or Suffolk breed, or high grades. If on a worn-out farm, or one of thin land, where

grass must be your main dependence, the pure Berkshire or its high grades is decidedly the animal you want. It is the best grazer we have. If you are on corn and clover land, rich bottoms, alluvial timber, or fertile prairie land, raise the Poland-China, the Cheshire (Jefferson County), or the Jersey Reds. If you wish to mix grain and grass farming, graze your hogs in summer and corn in winter, make the Berkshire cross with some of the abovenamed.

The claim has been made in some advertisements through the West that the Jersey Reds were cholera proof. It is deemed a duty to say that this claim has no foundation whatever. On farms in this section where they are kept with other stock, the disease attacks them indiscriminately, as would be expected by any one that understands the cause and nature of the disease. But whatever kind of farm you may have, or whatever breed you may raise, you can rest assured, that if you make any money at the business you must give it your most careful consideration, and your profits will be in exact ratio with the business principles and practical common sense you employ in carrying it on from day to day.



PRIZE GOLDEN WYANDOTTES.

GOLDEN WYANDOTTE FOWLS.

One of the most attractive novelties in recent exhibitions of poultry were the Golden Wyandottes. In all points except color they are similar to the older and well-known varieties of Wyandottes, but are heavier, more hardy, and mature earlier. The color of the male, on breast and wings, is a deep rich golden-bay, laced with black, and the hen is a deep gold color, laced with black. There is little penciling in the center of the feathers, and clear, bright hackles. Their general appearance is striking and beautiful. The variety originated a few years ago, and rapidly found favor among fanciers. Last autumn a "Golden Wyandotte Club" was formed, with a view of promoting the pure and uniform breeding of this new variety. At the recent meeting of the American Poultry Association it was voted to admit the Golden Wyandottes to the standard. They are therefore entitled to a class in all poultry exhibitions, and are likely to become one of the leading classes of standard poultry throughout the country. Our illustration, which was drawn from life, shows a pair of Golden Wyandottes owned by Sid Conger, of Riverside Poultry Yards, Flat Rock, Indiana. The pair took the first premium at the great national poultry exhibition, Indianapolis, Indiana. The cockerel scaled ninety-four and a half out of one hundred possible points.

THE "ORPHAN ASYLUM" BROODER.

MISS E. K. WINANS, N. J.

A few years ago, when contemplating to raise several hundred chickens with only fifteen sitting hens, I devised a plan which I termed my "Orphan Asylum," and which proved a perfect success. Most of the chickens were brought up in brooders, while the hens were given more eggs to hatch. The asylum was moved into outdoor quarters about the middle of May, and there was a frame made of broad boards standing on their edges and pegged together at their ends. It stood on the grass plot in the vegetable garden, and every few days was moved a little way, so as not to injure the grass. The lower edges of the boards must be so closely fastened down that even the smallest chickens cannot get out. When the birds are old enough to fly over, they can also find their way back. At three weeks old they will begin to do mischief in the garden and to the smaller chickens in the brooders, and must be moved to another yard. It is best to have these yards oblong, and one end roofed and floored, and provided with a movable wire screen with which to shut in all the chickens in wet weather. That year there was a terrible three days' storm, but not one of the orphans died during it, though they complained bitterly of being desperately bored in their prison.

One of the advantages of raising chickens without the assistance of hens becomes apparent on rainy days. Hens will trample on the small, draggled forlornities, or, if they are all kept shut up together, they will trample on the restless little teases, as they then regard their children. After the middle of May no artificial heat is needed in the brooders, except in those for the new hatches. I kept one warmed box especially for the babies until they were four days old. At first I used a tiny night lamp to heat a zinc sheet in the box, but that made it too hot, and then I found that a great tin pail of hot water, filled twice a day and kept thickly wrapped, warmed my brooder to ninety degrees, and that was heat enough in summer. I had a shelf over the pail and a rug tacked on the inside of the top of the box, and hanging down in front. An easy ladder led up to

the shelf, so that the chicks might come out and lie in the sunshine. As soon as they were strong and active they were put into brooders made of a slanting board, lined with some bright-colored fleecy rugs condemned as too shabby for the parlor. The one for the baby-chickens was brilliant yellow, and when six Houdans, in a row, looked out from under it, the effect was as good a design for an Easter card as any hen stretching her poor wings over a brood. The whole asylum looked like a pretty encampment, and was of great interest to its mistress's friends. There was a new little baby in our house then, and all the people who came from town to see him were enthusiastic over the livelier babies in the Orphan Asylum, and said they envied me my fascinating work. They only saw the sunshiny side. The girls in the village named it the Orphan Asylum, but coming oftener, they sometimes found me, with rubber boots on, working in an Atlantic storm. That is the "seamy side." Our doctor brought me a big buffalo robe which his puppy had torn, and at night I tucked that around all the younger chickens' brooders.

It is said that there is no profit in late hatched chickens, but I find them always profitable. Many boys and girls would be glad if they had raised two hundred chickens in the way I speak of, and had sold them in the fall, even if they made on each only ten cents clear gain. If you try it, do not let any one persuade you not to go out to care for your asylum as often as usual on stormy days. The worse the weather is, the more the orphans need their five or seven meals a day; and no matter how pretty a dress you have on, or what delightful company there is on the piazza, don't fail to fasten in the chickens, safe from rats, every night. Beware of clucking hens near your brooders. One evening I found the babies had deserted the asylum and had crowded into the coop of an old hen who had twenty chickens of her own, but was delighted to get thirty fresh ones. This shows the yearning of some chickens for other than human care. The rest prefer women's attentions, and grow absurdly tame, running under one's dress till walking is impossible. One loving creature used to stand on the piazza and wail till I came to it—with its dinner.

To clean every crumb of food away after each meal seems to me the best way, although very high authorities advise keeping dry food always near the chickens. A good quality of the ground meal sometimes called "horse-feed" is capital for chickens, especially if there is in it a large proportion of buckwheat. In summer it is a good plan to bake bread of it twice a week and crumble it freshly for each meal. Milk is almost necessary, and if in any way a supply can be had cheaply secure it. A writer, calling himself curiously enough "Chicken Idiot," once objected to it, saying that he never knew a hen to give milk. Neither do hens give wheat, but chickens flourish on wheat. Indeed, on that basis they would be limited entirely to a diet of eggs. See that they have every day, besides their regular meals, proper animal food, green food, bone-meal or oyster shells, and clean water or milk.

I was accused of cruelty in making the hens sit the second or third terms, but it is not really cruel. Most of them, after the chickens have been taken away, think that they have merely had a delicious dream of little soft creatures and sweet voices, and settle contentedly on the new eggs. And if there is one mother who makes your heart ache too much by calling for the children that are gone, you can give them back again, and put her, a commonplace hen, in a commonplace coop.

A Good Poultry Food.—When fowls are kept on an exclusive corn diet the year round, the production of eggs can generally be increased considerably by the judicious use of some "egg food." W. H. Allen, Androscoggin Co., Maine, sends us the following recipe, which he has found to combine all the necessary requisites in a poultry food: One pound each of bone, linseed cake, dried meat, oats and oyster shells, all finely ground; one-half ounce of sulphur, one ounce of red pepper, two ounces each of common table salt and copperas, one-half ounce of soda, one-half ounce of ginger, and one-quarter ounce of black pepper. Mix the whole thoroughly, and allow a tablespoonful three times a week to each fowl.

Washington Territory Prunes—A Promising Industry.—Our esteemed correspondent, Carlos W. Shane, Clark Co., W. T., sends us some samples of prunes, which for size and quality equal, if not excel, any imported prunes we have ever tasted. They were grown and dried by Arthur W. Hidden, who has now four acres of prune trees, from which his crop, after having been dried, amounted to eleven tons. Several varieties have been tried, but the Italian prune gives the best satisfaction. When four years old the trees begin to bear, at six years they produce paying crops, and at ten they pay a large profit. "Besides these," Mr. Shane writes us, "we can cultivate other fruits, notably cherries, pears, apples, and all the best small fruits. Of vegetables, our county can produce peas in size, quality, and quantity not surpassed even in Old England, also beans, sweet corn, tomatoes, etc. We are looking for some experienced cannery man to locate here. The winter blizzards of the East have already given an impetus to our glorious Territory, where people live, not vegetate. Our weather 'is just splendid,' not too cold, nor yet too warm. Spring weather just right for farming."

STARTING AN ORANGE GROVE IN FLORIDA.

VICTOR SCHMELZ, ORANGE CO., FLA.

In this region the best ground for oranges is hard-wood hommock land. Here the soil is sandy, of chocolate color, covered with a thick layer of leaf-mold, and so rich that it requires no fertilizing. On such land, if good, healthy, three year old trees are planted, a good crop is realized in about eight years from the time of planting.

The principal expense with hommock groves is the clearing, which costs from fifty to one hundred dollars per acre. The original timber consists mainly of hickories, live and other oaks, magnolias, and cabbage palm, while the undergrowth is composed of grape-vines, various shrubs, and Saw palmetto. It is the latter we have most to contend with, as the ground is fairly interwoven with its roots. The first work to be done in clearing is to cut down the undergrowth, placing the larger timber on top. When the brush is dry enough fire is set to it; this burns up all the small sticks, and admits of getting at the larger logs, which are then piled up in turn and burned also. The palmetto and other roots are then grubbed out and burned, after which the land is plowed—very shallow—generally with one horse or mule and a light turn plow. The ground is then staked off for the trees. Twenty-five feet each way is the usual distance, but for the Tangerine and Mandarin trees, which are of smaller growth, twenty feet each way is sufficient. The most economical way, however, is the quincunx plan, which brings the rows twenty-one feet seven inches apart, and the trees twenty-five feet in the rows. The spot for planting the tree is prepared by another grubbing out of all the roots for a space eight feet in diameter and eight inches deep. The trees are then planted the same depth they stood in the nursery rows; the fibrous roots have to be well spread out with fine soil worked between them. It is upon the proper care bestowed on this work that the success of the orange grove depends. A mulch of pine straw is very helpful to keep the soil damp. The ground around the trees should be ridged up, partly to steady the roots, and also to hold water. These ridges are removed after about four months, when the ground is plowed shallow and leveled around the trees. The grove should be plowed four times a year, and at least two hoeings around the trees should be given; in addition to this the ground should be harrowed or cultivated repeatedly, the oftener the better. While the trees are young it is a good plan to sow cow-peas between them for plowing under as a fertilizer. The center lands may be planted with sweet potatoes for the first few years, as this clears the ground well of roots.

Most of the Florida orange groves are on yellow pine land. This costs considerably less to clear, and being lighter is worked easier; but as most of it is poor it requires heavy, and often expensive manuring. The home resources for fertilizers consist of muck composted with lime, stable manure, poultry droppings, etc. Any one choosing this kind of land should make sure of securing a muck bed that can be drained easily. Then there is leaf-mold, which in some places is found six inches deep, also marl, and the shell mounds, which make an excellent fertilizer. Mulching is of still greater importance on such land; pine straw, leaves, grass, and even brush are used for this purpose, but the best and cheapest material is Saw palmetto, which is very abundant in most localities and can easily be cut with an ax or brush hook. In addition to these home fertilizers, cotton-seed meal, and Mapes' orange tree manure are used extensively. Special fertilizers should be applied about three times a year, in February, May, and July. They are generally put on before plowing, the first year one pound per tree each time, the second year two pounds, the third four pounds, and so on. A tree in full bearing requires from ten to twenty pounds according to its size. To bearing trees it should be applied only while the fruits are yet small, and never later than June. Taking all considerations into account, yellow pine land is to be preferred if one intends to make his home near the grove, but if profit be the only object in locating an orange grove, hommock land will prove the better investment.

THE CHAROLAISE CATTLE OF FRANCE.

Any one looking over reports of the live-stock market of Paris is impressed with the fact that the quotations refer to the different races of cattle in market. He will find separate prices reported for Charolaise, Cotentin, Limousine, and many other classes. Of these the Charolaise is the leading breed. These cattle come from Normandy, where they have been bred from time immemorial. They are of little value for the dairy, but possess fine qualities for beef. In form they somewhat resemble the Shorthorns of England and America, having elastic skin, straight backs, well sprung ribs, good hind quarters, and short horns. They mature early, and fatten easily. But they are much coarser in bone than the Shorthorns, and will thrive on thin meager pasturage, where a well-bred Shorthorn would well-nigh starve. In those parts of Normandy where they are the leading breed, these cattle are allowed to "rustle" on pasturage, and are stabled and fed only during the most inclement weather. The oxen are very useful for the yoke, their heavy forms and strong bones giving them great power for work. Their beef is finely marbled, of good flavor, and is laid on the loin and other parts of the hind quarters where it will do the most good. There was for a time a prejudice against crossing this breed with the Shorthorns, which they so much resemble. But recent experience has dispelled this groundless prejudice, and the cross has proved highly successful. At the recent fat-stock show in Paris the highest premiums were awarded to animals of this cross. Our illustrations are from photographs secured by Charles F. Williams, U. S. Consul at Rouen, France. Figure 1 shows a Charolaise steer, and figure 2 a cow of the same breed.

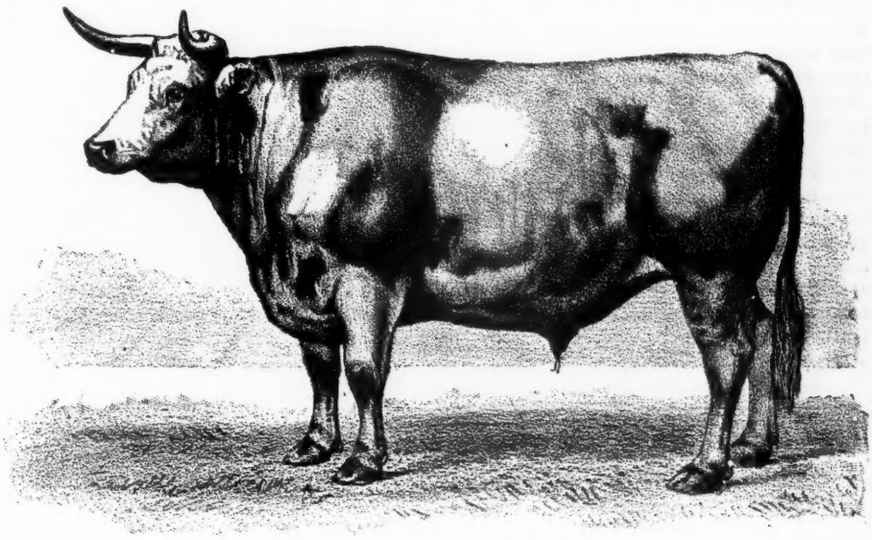


Fig. 1.—TYPICAL CHAROLAISE STEER.

Culture of the Castor-Oil Bean.—The Castor-Oil Bean is a very rank, coarse-growing plant, and requires a rich soil and high cultivation to insure a remunerative crop of the seeds or beans, as they are called. The plant will flourish in good soils anywhere in the South, as well as in many of our Northern States; but the first thing to be taken into consideration by the cultivator is a market for his crop, and this can rarely be disposed of to advantage except at the oil mills where the oil is extracted. At the present time the principal castor-oil mills are located in Missouri—St. Louis being the center of this industry—and a few manufacturers control the entire castor-oil trade of the country. It is quite probable, however, that some of the cottonseed-oil mills in the South would work up the beans, provided they could obtain a sufficient quantity to pay. Planters in the South who may take an interest in this industry should call on the owners of the oil mills and see what arrangement can be made. Castor-oil is and has been scarce, and commands a high price.

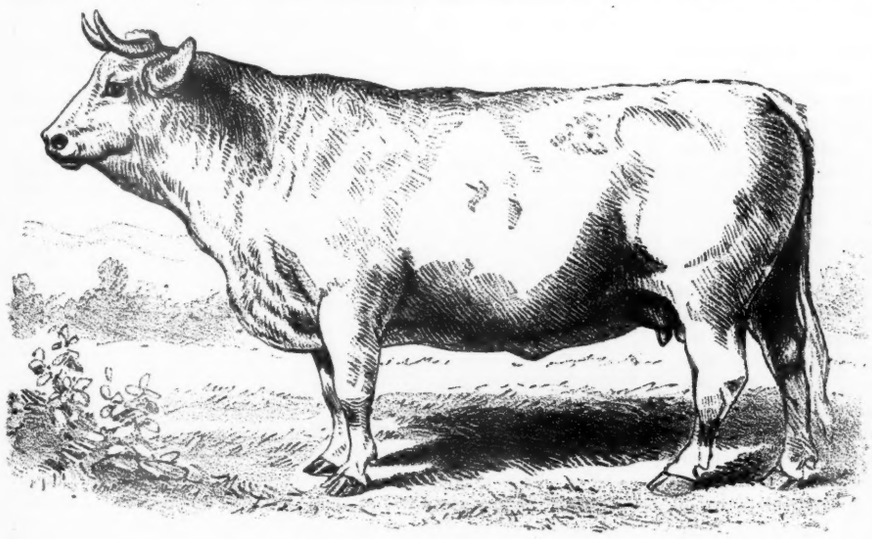


Fig. 2.—TYPICAL CHAROLAISE COW.

WATER SPOUTS AND CYCLONES.

An unusual number of water spouts has been observed at sea during the winter months. In the month of January they abounded apparently as freely and recklessly as if it had been July. They were seen in the latitudes of Savannah and New York, and in the longitudes traversed by the Gulf Stream. The Hydrographic Bureau, which in March made a brief but interesting report on these phenomena, describes them as special cases of tornado and whirlwind, but on a more limited scale. The condition favorable to the production of these water spouts is a layer of warm moist air at the ocean surface, as would happen in the Gulf Stream, and above this a layer of cooler and drier air. This brings about a state of unstable equilibrium, and Nature at once sets about the task of reforming the situation. The warm air rises into the cooler, and if the difference of temperature is marked there is rapid and intense action, which is increased by the condensation going on. The surface air from all around rushes in, takes on a rotary motion and escapes in an upward direction. At the center of the whirl a vacuum is created, and into this water is drawn and carried to a great hight in large volume. Frequently the top of the water spout is seen first as a great rotating mass of black cloud and whatever else may be. There is a close analogy between these water spouts and the tornadoes and cyclones that devastate some of the Western States and which are not unknown in the East. The conditions of their formation on land are like those on sea; hot air below rising to mingle with cold air above, moisture abundant in one part of the contending strata and in scant supply in the other. Condensation follows, there is electric action and the surrounding atmosphere hastens to join in the mélée, the rotary motion is set up, the upper portion of the rotating mass is a black and angry cloud and the appearance is given that the terrible devastation so rapidly approaching is organizing in the upper air, for there most of the appalling danger seems to be. The waterspout and the cyclone move on till the force that set them in motion is exhausted, or until they have vented their fury upon whatever comes in their path, whether forest or orchard, town or hamlet, ship or shore. The causes of these phenomena are pretty well understood, albeit their capricious phases often baffle the best scientific speculation. But, by what means they are to be prevented on land is not easy to say. The winter blizzard, the Texan norther, and the summer hurricane are forces of nature that take little account of the puny agencies employed against them. We have at least the comfort of knowing that science has its "weather eye" on these erratic creatures, and that we can be gravely instructed as to what they can accomplish, after they have executed their horrid work.

THE GROWTH OF WHEAT, AND ITS PRODUCTS IN THE MILL.—IX.

JOHN J. WILLIS, SUPERINTENDENT OF LAWES AND GILBERT'S EXPERIMENTAL FARM, ROTHAMSTED, ENGLAND.

We have now to consider the effects of a continuous liberal manure supply to the wheat plant, and the subsequent chemical composition of the grain, or, on the other hand, of exhaustion of soil fertility, and its effect on the quantity and the composition of the wheat produce. From the produce of each of ten selected plots in the Rothamsted experimental wheat field, ashes were prepared representing the grain and the straw separately, of the ten years 1852–61, and again of the ten years 1862–71. It is obvious, however, that before we can form a trustworthy judgment how far any differences in the composition of the wheat ash, in that of the dry substance of the wheat plant, or in the yield of individual constituents per acre, over the two periods mentioned, are due to supply of plant-food, or soil exhaustion, we must decide whether the first ten or the second ten seasons were the most favorable for the wheat crop, so as to discriminate as far as possible between results due merely to season, and those due to manuring. The following table, which gives the mean results for the ten plots, over the first and second ten years, as to general characters of the produce, and the yield per acre of wheat grain, wheat straw, and total produce of nitrogen, total mineral matter, and of each ash constituent, will throw light on the characters of the two periods under discussion.

Rothamsted Experiments—General Characters of the Wheat Produce, and Quantities Per Acre, pounds—Mean Results for ten Plots over each Period:

	Grain.		Straw.		Total Produce.	
	10 Years, 1852-61.	10 Years, 1862-71.	10 Years, 1852-61.	10 Years, 1862-71.	10 Years, 1852-61.	10 Years, 1862-71.
	Pounds.	Pounds.	Pounds.	Pounds.	Pounds.	Pounds.
Weight of Grain, Per Bushel,	57.1	60.2	------	------	------	------
Produce, Per Acre	1740	1833	3192	2878	4932	4711
Nitrogen, " "	29.8	28.0	14.3	11.5	44.1	39.5
Ash (pure)" "	28.9	28.9	148.7	134.6	177.6	163.5
Ingredients of Ash:						
Lime	0.88	0.98	7.64	8.49	8.52	9.47
Magnesia	3.07	3.10	2.18	2.49	5.25	5.59
Potash	9.47	9.57	29.93	25.35	39.40	34.92
Soda	0.06	0.05	0.61	0.83	0.67	0.88
Phosphoric Acid	14.68	14.38	4.69	4.28	19.37	18.66
Sulphuric Acid	0.35	0.45	6.47	5.46	6.82	5.91
Chlorine	0.02	0.03	5.23	5.27	5.25	5.30
Silica	0.22	0.17	92.26	83.05	92.48	83.22

It is seen that the second period, though yielding less straw, and less total produce, characters which indicate less luxuriance, that is, less accumulation during the vegetative stages of the development of the plant, nevertheless gives more grain, a higher proportion of grain to straw, and a higher weight per bushel of grain. In fact, while in the country at large only three of the first ten years gave more than average produce of grain, six of the second ten gave over average; and while the first ten years gave on the whole less than average produce of wheat grain, the second ten gave more than average. It is clear, therefore, that the first ten years were on the average more favorable for luxuriance, that is, for total accumulation by the wheat plant, but that the second ten were more favorable for seed-formation and maturation. Accordingly, the table shows that, taking the average of all the plots, there was rather more nitrogen, and more total mineral matter in the total produce (grain and straw), over the first than over the second ten years; and so far as the individual mineral constituents are concerned, there was, on the average, more potash, phosphoric acid, sulphuric acid, and silica, but less lime, magnesia, soda, and chlorine, taken up from the soil and retained in the crops over the first ten years. There was, however, with the more favorable seed-forming tendencies in the second ten years, with the less amount of total mineral constituents taken up from the soil by the plant, as much or more of almost every individual mineral ingredient accumulated in the grain. The only exception to this of any significance is that there was slightly less phosphoric acid in both grain and straw in the second ten years.

It is interesting, and practically instructive to observe, that after a very careful examination of all the products derived from "milling wheat," that the grains grown by the more nitrogenous and richer manuring, and consequently in the larger crops, provided they were well developed and matured, always allowed of a better separation of the flour, and less cutting up and intermixture of branny particles with it; and hence yielding a cleaner bran than the grain of poorly manured crops. This, however, was found not to be the case, unless the grain from the highly-manured crops were at the same time well developed. And it is consistent with this character of the grain of the more highly-manured crops, that the produce of the heavier and richer wheat lands is generally admitted to yield a larger proportion of flour, and the value to the miller of any particular variety of wheat depends very much upon the quantity of marketable flour it will yield on milling.

Table Showing Produce of Wheat Per Acre, Weight Per Bushel, and Proportion of Fine Flour Obtained by Milling Four Varieties of Wheat Grown under Similar Circumstances:

Variety of Wheat.	Quantity Grown Per Acre.	Weight Per Bushel.	Amount of Fine Flour.
	Bushels.	Pounds.	Per Cent.
Downy White Wheat	48	62	80.6
Dantzic, red	43½	63	79.8
Whittington, red	33	61	72.2
Talavera, red	52	61	78.5

In each of these descriptions of wheat, and especially in the last, a striking difference presents itself, both in the relative weight of grain reaped and in the quantity of fine flour obtained. And it may be observed that the largest crops of forty-eight and fifty-two bushels of wheat, respectively, gave the highest percentage of flour. The fact that the grain of richly-manured crops is frequently coarse, and not the good miller's sample, arises in most cases from the circumstance, not of the direct effect of rich soil or manuring in depreciating the quality of the grain, but because the larger crops are more subject to injury, due to climatic circumstances, and are consequently frequently less favorably developed and matured.

The following data will assist us in understanding this part of our inquiry.

Table Showing Produce Per Acre, and Chemical Composition of the Same Variety of Wheat, Grown without Manure, and with a Manurial Supply, in the Same Field, and in the Same Year:

How Treated.	Dressed Grain Per Acre.	Fine Flour Obtained on Grinding.	Albuminoids in the Flour.
	Bushels.	Per Cent.	Per Cent.
Without Manure	31½	76.6	9.4
With Artificial Manures	48½	64.6	10.0
With Artificial Manures	40	66.5	10.5

These figures show that the artificial manures raised the produce of grain seventeen bushels per acre in one case, and eight and a half bushels in the other, over the unmanured land, but these, being of a coarser quality of grain, yielded to the miller a smaller percentage of fine flour and more bran. The flour, however, on being submitted to analysis, gave a slightly higher proportion of albuminoids, and consequently a lower percentage of carbo-hydrates.

Table Showing Complete Analysis of a Variety of Red Wheat Grown in the Same Year, without Manure, and with Farmyard Manure:

Constituents of the Grain.	Without Manure.	Farmyard Manure.	Farmyard Manure.
Moisture	14.2	14.3	14.2
Albuminoids	9.9	14.8	13.0
Oil and Fatty Matters	4.7	4.2	4.8
Woody-fiber	2.3	2.4	3.3
Carbo-hydrates	66.6	61.6	62.3
Mineral Matter (ash)	2.3	2.7	2.4
Total	100.0	100.0	100.0

The above results show how enormously the farmyard manure increased the amount of albuminous matters in the grain, and more particularly in the wheat, the composition of which is given in the second column. The dung employed in this case (that is, the second column of the table) was made by horses, and that from which the wheat was grown that gave the results of the third column was made exclusively by cows. Milch cows are reputed to produce a less forcing and useful manure than horses or fattening animals. The amount of carbo-hydrates or starchy matters was found to be much the highest from the wheat grown without manure. The oil, woody fiber, and mineral matters are in nearly equal proportions

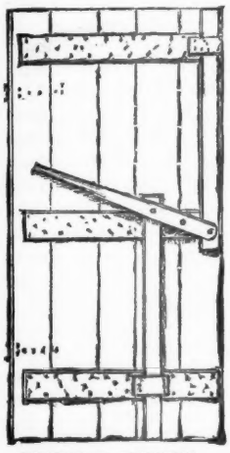
under the three different treatments. A bad ripening season is sure to increase the proportion of bran by increasing the outer integument of the berry. The following table shows the quality and products on milling of seven varieties of English wheat, three white and four red, grown in the same season and under the same manurial treatment.

Table Showing Weight Per Bushel of Different Varieties of Wheat, and the Percentages of the Various Products Obtained on Milling:

VARIETY OF WHEAT.	WEIGHT PER BUSHEL.	FLOUR.	MIDDLINGS.	FINE BRAN.	COARSE BRAN.	TOTAL.
	Pounds.	Per Cent.	Per Cent.	Per Cent.	Per Cent.	Per Cent.
Hunters, white	62	74.40	10.50	10.50	2.10	97.50
Challenge, white	63½	73.40	12.10	11.10	2.70	99.30
Suffolk, white	61¼	68.33	12.88	12.22	3.00	96.43
Suffolk, white	64	74.83	11.00	9.91	2.00	97.74
MEAN	62¾	72.74	11.62	10.93	2.45	97.77
Square Head, red	61	73.40	11.70	10.90	2.80	98.80
Golden Drop, red	62	75.00	11.20	10.80	2.60	99.60
English, red	62½	74.92	12.07	10.64	1.50	99.13
Norfolk, red	62	74.00	10.70	11.00	2.60	98.30
MEAN	62	74.33	11.42	10.84	2.38	98.96

A CONVENIENT BARN-DOOR FASTENER.

The old device for securing the wide double doors of a barn consisted of a pole pivoted by its center to one of the doors, and projecting at top and bottom. It is very liable to swing around at unexpected times and get in the way. A greatly improved fastener is shown in the accompanying illustration, which was engraved from a sketch furnished us by D. G. Piper, Indiana Co., Pennsylvania. It consists of a lever pivoted by a half-inch bolt to the middle cleat of the door, with a bar on each side of the pivot, playing loosely on a bolt by which it is attached to the lever. One of the bars fits into a slot above the door and the other in a similar slot in the door-sill. By depressing the end of the lever the bars are thrown into the slots and hold the door securely fastened. When it is desired to open it, the lever is raised and the bars are withdrawn to the position shown in the engraving. The ends of the bars are held in place by rabbeted cleats, through which they slide freely. The only special expense involved is the trifling cost of the three half-inch carriage bolts.

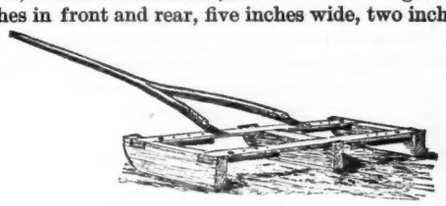


BARN-DOOR FASTENER.

Transplanting the Kalmia—(*Laurel*). Contrary to the common opinion that *Kalmia latifolia* is very difficult to be transplanted, A. B. Allen finds that it is safely and easily transplanted, if properly done. Sixteen or seventeen years ago, he writes us, I transplanted quite a number of these, which bordered on their forest of pines and shrub oaks, some of them standing shaded within it. The soil where they grew and to which they were transplanted is a mixture of white sand and fine gravel, and of very poor quality. I selected the most vigorous and thrifty shrubs I could find, growing each by itself in a thrifty mass of about two feet diameter, and of the same hight. The roots of these grew quite shallow, and did not extend in the ground much beyond the spread of the stalks above it. Thus each mass was easily taken up, and a fair quantity of soil with it, soon after noon, and immediately set out. They thus escaped much of the heat of the day in changing their location. Most of this was done in the month of April, but some during rather a hot spell in May. The latter did as well as the former. I had the precaution to set all among small Norway Spruce and White Pine, which shaded them somewhat from the sun. As the trees grew in size, and shaded too much, they were cut down as often as required for space and air for the growth of the Kalmias. I think it is necessary for them to have a little shade in so dry and thin a soil as mine is, for I found that mulching was not a sufficient protection, if exposed all summer to the sun. If planted on a very stony or rocky soil, kalmias would not probably need protection from the shade of trees, particularly if they stood pretty close to each other. I have seen immense masses of them growing vigorously, and in great beauty, on the lower ranges of the Alleghany Mountains.

AN ADJUSTABLE CORN-MARKER.

Our illustration shows a useful and convenient implement which can be made by any farmer, with very little outlay for material. It was devised by E. R. Armentrout, Augusta Co., Virginia. The three runners are each three feet long, ten inches wide, and two inches thick, rounded off in front, as shown in the engraving. They have notches in front and rear, five inches wide, two inches deep in

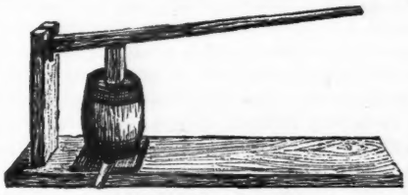


ADJUSTABLE CORN-MARKER.

the outer ones, and one inch in the middle one. Pieces of inch board, each five inches wide and fifteen inches long, are firmly fastened in the notches of the outside runners, the outer end of each being flush with the side of the runner, and about three inches from the other end is a square half-inch hole for a carriage bolt. The cross-pieces or benches are each eight feet long, five inches wide, and an inch thick. The middle of each one is firmly nailed in the notch of the middle runner. Half-inch holes are bored along the center of each bench, at intervals of six inches. The width of the marker is adjusted by placing the outer runners at the desired distance from the inner one and fastening them by bolts through the holes in the short pieces and the long benches. The tongue is a stout pole of any tough hard wood, split up with a saw at the lower end and attached to the front bench by a pair of old gate hinges. If it is desired to add to the weight of the marker and thereby deepen the marks, boards can be laid across the top upon which to put stones, or the driver can ride.

A LEVER LARD-PRESS.

R. S. Foubion, Jasper Co., Illinois, furnishes us a sketch and description of a home-made lard-press, shown in our illustration. The foundation is a plank six feet long, fourteen inches wide, and two inches thick. An upright, two by six inches, has a slot at the top to receive the lever, and a tenon on the lower end extends several inches through a mortise cut in the plank, six inches from the end. The projecting tenon has two mortices by which it is firmly keyed by wooden wedges beneath the plank table. Both heads are removed from a three-gallon oak keg, well hooped, and one end is set upon an inch board, fourteen inches square. A line is drawn on the board, just outside of the keg, which is then removed, and a hole cut through the board just the size of the keg. The board is then nailed upon the top of the plank, one foot from the upright, the keg set into it, and a spout fitted to project over the side. A lever of tough hard wood, with a three-quarter inch hole, is fitted loosely into the slot in the top of the upright, and secured by a bolt, as shown in the engraving. To work the press, the keg is filled with "cracklings" and the heads, which have been



HOME-MADE LARD-PRESS.

trimmed down around the edges, are placed upon them, so that the grain of one head shall lie crosswise of the other. A follower, which may be sawed from any stick of the right thickness, is then set upright under the lever, and the pressure applied. The lard is discharged from the spout and received in a dish set for the purpose. The press may be set upon trestles, or provided with legs. In the latter it would be necessary to put an extra leg directly beneath the cask to support the pressure when the press is in operation.

THE ORNAMENTAL CURRANTS.

There are in the far West, and especially in the mountains of California, Oregon, and northward, several species of *Ribes*, or Currant, with flowers so showy as to entitle them to a place among ornamental shrubs. Several of them are in cultivation under the rather indefinite name of "Flowering Currants."

THE MISSOURI CURRANT, also called "Golden-flowered" and the "Buffalo Currant" (*Ribes aureum*), is a native of Missouri to Oregon. It reaches the hight of twelve feet, is smooth, with three-lobed leaves and bright yellow flowers in racemes, blooming in early spring. The flowers have a pleasing spicy fragrance, and are followed by a mostly blackish fruit, very variable in color and quality. This was introduced into British gardens in 1812, and is popular there, as it is here, on account of its rich fragrance. This makes an excellent stock on which to graft the garden gooseberries and currants to form little trees, which are very showy when loaded with fruit. Grows readily from cuttings.

RIBES SANGUINEUM.

THE CRIMSON-FLOWERED CURRANT (*Ribes sanguineum*), a native of California and Oregon. It grows from two to twelve feet high, and varies from smooth to very downy. The flowers are in dense racemes, in the typical form, of a fine rose-color, and in the wild state varying to flesh-color and white, or in the variety *variegatum* the calyx is red and the corolla white. The engraving shows the abundant flowering character of this species. This is regarded as somewhat tender in the Northern States; indeed, we have never seen plants in our gardens that approached the wild plants in the California mountains in beauty. The plant is so variable in other respects, it is likely to vary in hardiness, and a proper selection would no doubt give us plants sufficiently hardy to endure our winters. A hybrid (*R. Gordonianum*) between this species and the Missouri Currant (*R. aureum*) is offered in the nurseries as more hardy than *R. sanguineum*, and a profuse bloomer with crimson and yellow flowers.

THE FALSE MITRE-WORT—(*Tiarella*).

None of our readers need be deterred from making a rockery by the fear that they might not be able to stock it with suitable plants. There need be no difficulty in this respect, as wherever there are woods and rocks, especially in northern localities, an abundance of suitable plants for an artificial rock-work may be had without any outlay of money. In selecting plants for a rockery, it is desirable to have those with attractive foliage as well as flowers, and those with persistent or evergreen leaves are to be preferred. In the present month numerous plants may be found in flower, and may be marked for future removal, or they may be removed at once. It is not well to disturb plants while they are in flower, but in case of these wild plants, if we cut away the flower-stems and get good roots, shading the plant until it is well established—with the exception of some very delicate subjects—these wild plants may be transplanted at one time as well as another. One of the attractive plants of the month, and one very suitable for the rockery, is the "False Mitre-wort" (*Tiarella cordifolia*), which is quite abundant in northern localities, where it forms clumps by means of its leafy runners, of the aspect shown in the engraving. Its flower-stems are about a foot high, bearing numerous small white flowers. The name *Tiarella* is the diminutive of *tiara*, a turban, from the shape of its pistils. A pretty little related plant is called *Mitella*, from the Greek word for mitre or a bishop's cap. To that properly belongs the name "Mitre-wort," and to Tiarella the name "False Mitre-wort" has been given. The Mitellas, there being two species, are pretty little plants, and found in similar situations with *Tiarella*, and like that may be transferred to the rock-work. Both these plants, *Mitella* and *Tiarella*, belong to the Saxifrage Family, and those who study plants will find the structure of their flowers very interesting. Most Saxafrages are well adapted for rockeries.

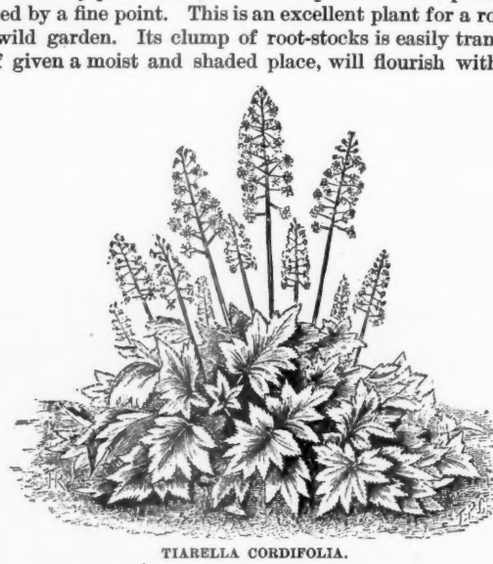
THE STAR-FLOWER—(*Trientalis*).

Those who visit old and shady woods this month, with their eyes open, will be likely to be rewarded by finding in some moist

TRIENTALIS AMERICANA.

and sheltered nook a clump of the "Star-flower" (*Trientalis Americana*). If the finder can see beauty in symmetry and exquisite neatness, he will stop to admire it; for, though not at all showy, the lover of flowers will find it beautiful and linger over it with pleasure. The name Trientalis is from the Latin *Triens*, the third part of a thing, and was applied to the European species, as referring to the third part of a foot, which is the hight of that species. In similar situations both in Great Britain and the northern portion of the Continent there is found *Trientalis Europœa*, which our species so closely resembles that it was at one time regarded as an American variety of it. The difference in the shape of the leaves, and also of the petals, is thought by modern botanists to sufficiently distinguish *T. Americana* from *T. Europœa*. The European species grows in Alaska and other far northern parts of this continent.

The engraving shows the habit of our plant. The slender stem springs from a creeping root-stock, is from four to eight inches high, naked below, and bearing at the summit a whorl of five to nine leaves. From the axils of these leaves arise slender flower-stalks, bearing a single flower, with its parts mostly in sevens, and of a beautifully pure white, sometimes pinkish. The petals are terminated by a fine point. This is an excellent plant for a rock work, or a wild garden. Its clump of root-stocks is easily transplanted, and if given a moist and shaded place, will flourish without difficulty. Propagated by division. Some works give "Chickweed-Wintergreen" as the common name of the plant. As we can see no appropriateness in such an uncouth and meaningless name, we adopt that by which it is generally known in England—"Star-flower."



TIARELLA CORDIFOLIA.

JACOB'S LADDER—GREEK VALERIAN.

There are two hardy herbaceous perennial plants cultivated in our gardens to which the above common names are applied, but without much precision. They are species of *Polemonium*, an ancient name the meaning of which is rather obscure. The genus gives its name to a family, the *Polemoniaceæ*, to which *Phlox* and *Gilia*, two rather important garden genera, belong. Of the genus *Polemonium* there are in the United States about a dozen species and varieties, mostly growing on the mountains of the far West. Two species, *P. cœruleum* and *P. reptans*, are old garden plants which have special claims upon our consideration; they have blue flowers, and they are natives. *P. cœruleum* has stems one to three feet tall, with very handsome compound leaves consisting of nine to twenty-one leaflets. The flowers are numerous, in a narrow panicle; they are of a fine blue color, and nearly an inch across. It is called Greek Valerian from some resemblance to the true Valerian, and Jacob's Ladder from the regularity with which the leaflets are placed above one another, like the rounds of a ladder. It is raised by division and seed. It is a native of Asia and Northern Europe, as well as a number of localities in this country. There is a variety of this with its leaves marked with white, which is one of the most beautiful of variegated plants, having much the appearance of a variegated fern. Unfortunately the markings are not permanent; the foliage is killed by the frost, and when new leaves appear the following spring they are very apt to be of a pale green. The habit of Jacob's Ladder is shown in figure 1; that of the Creeping Polemonium is given in figure 2. The low and spreading stems are six to eight inches high. The leaves have seven to eleven leaflets, and the flowers are in a loose cluster, nodding, about half an inch wide, of a pale blue, sometimes white. This is an American species, found from New York westward, and is readily multiplied by dividing the large clumps.

Fig. 1.—POLEMONIUM CŒRULEUM.

THE BLADDER-NUT TREES—(*Staphylea*).

From Canada to the Carolinas there is found a shrub which should be better known, as it is worthy of a place among ornamental shrubs. The plant to which we refer is the Three-leaved Bladder-nut (*Staphylea trifolia*). *Staphylea* is a small genus, belonging to the same family with the Horse-chestnuts and the Maples, the Soap-berry Family, or *Sapindaceæ*. Besides the species found in the Eastern States there is one upon the Pacific coast, one common in the south of Europe, one in Japan, and still another in the Caucasus. Our species, while never very abundant, is widely distributed, and forms a neat shrub five to twelve feet high. It is much disposed to throw up suckers from the base, but if these are rubbed off as they appear, it can be made to assume a tree-like habit. Its purplish-brown bark is beautifully marked with whitish

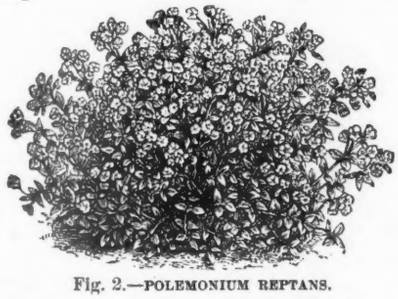
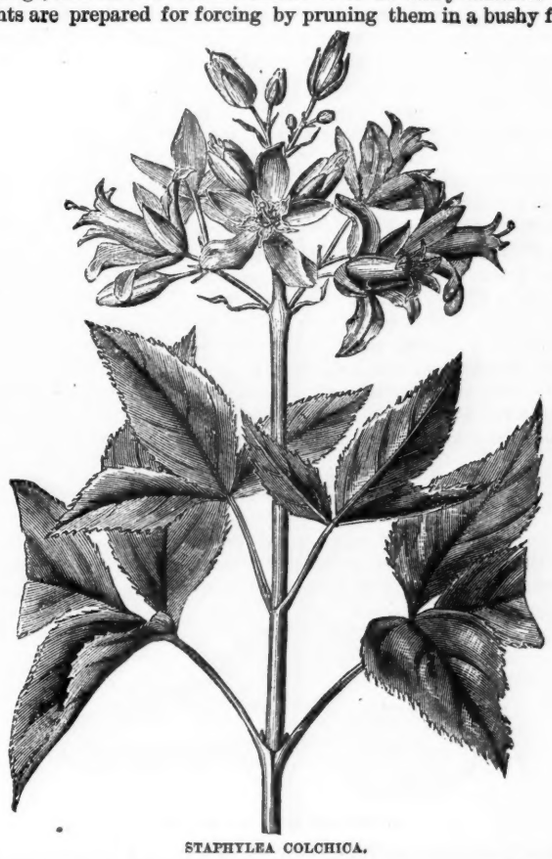


Fig. 2.—POLEMONIUM REPTANS.

stripes. The leaves are of three leaflets upon long petioles; the flowers are in pendulous racemes at the ends of the branches, or in the axils of the leaves. They are white, and each is succeeded by a three-celled pod, about two inches long, consisting of three united capsules, much like pea-pods, which they much resemble in texture; but very few seeds are perfected, usually but one in a single cell of the pods. The European species, *S. pinnata*, differs from ours in having five leaflets. It is called "St. Anthony's Nut," and "Job's Tears." Its seeds are strung and used as beads. Our mention of the native species is incidental to some account of two exotic species. The Japanese, *S. Bumalda*, came to us several years ago, and under the impression that it was a low-growing shrub, it was planted rather near a grapevine; it grew on, and last summer, when about twelve feet high, it bloomed very profusely with clusters of pure white flowers. It was a question of the "survival of the fittest," and it was decided that the *Staphylea* must go. Removal was not practicable, and the ax was applied. It was too fine a shrub to be lost without regret. *Staphylea Colchica* is the name of the species from the Caucasus. It grows three to five feet high, and its flower clusters are mostly terminal, as shown in the engraving. This is attracting much attention in Europe as a plant for forcing to supply flowers in winter. The shrub is easily propagated by layers or from cuttings, and its low stature allows it to be easily handled. The plants are prepared for forcing by pruning them in a bushy form,



STAPHYLEA COLCHICA.

to secure as many stems as possible. Our florists engaged in forcing flowers, should look into the merits of this, which is regarded abroad as a competitor of the lilac in furnishing flowers in winter.

Peppermint Culture.—Most of the peppermint oil produced in this country comes from Wayne and adjoining counties of N. Y. State. There are about three thousand acres devoted to the cultivation of the peppermint plant in the region named, and the annual product is not far from fifty thousand pounds of oil. The plants are set out in the spring and given very thorough and clean cultivation. The harvest begins in August. After the mint is mown it is allowed to wilt from eight to ten hours in the sun, then raked up and placed in cocks, where it must not be left for more than a day or two, else it will heat and spoil, but should go to the still while fresh and but slightly withered. The stills consist of wooden tubs strongly hooped, and into these the stems and leaves are packed by treading with the feet. When the tubs are filled, the covers, made steam-tight, are put on and fastened with clamps. A steam-pipe connects the lower part of the tub with a steam-boiler. Another pipe connects the top of the tub with the condensing-worm. When the steam is introduced from the boiler it permeates the contents of the tub and escapes through the pipe connecting with the worm, and at a pressure of about forty pounds the oil is volatilized and mixed with the steam, then carried through the pipe to the worm, where it is condensed and the mixed water and oil discharged into a receiver. The oil being lighter than the water it rises to the top and is readily removed. The cost of the apparatus required for distilling the peppermint oil will depend very much upon its capacity, and may cost from five hundred up to many thousands of dollars.

THE HOUSEHOLD.

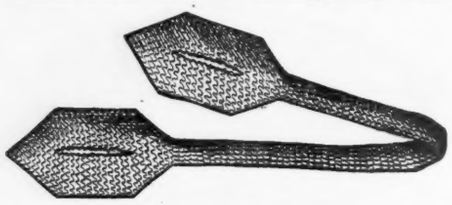
IDEAL HOUSEKEEPING.

In the house of the ideal housekeeper everything is in order all the time. No dust is visible anywhere, no finger marks are to be seen, the windows are always clear as crystal, nothing is out of place, savory meals are served at stated hours, and all the table appointments are simply perfect; washing, ironing, scrubbing, and mending are regularly and promptly done. The ideal housekeeper, in addition to keeping her house in immaculate order from Sunday to Sunday and from May to May, in addition to spring cleaning and spring sewing, to fall cleaning and fall sewing, to putting up fruit, tending plants and rearing children, finds time for reading, painting, music, the study of the languages, and for society, without neglecting the nurture of her own family.

This is a beautiful picture, is it not? and many a woman in trying to realize it in her own case has laid herself in a premature grave, or made life a burden release from which was gladly welcomed. "The life is more than meat and the body than raiment." The house-mother is more than the house, and she owes it to herself and to her household so to adjust her work that care of herself and her household may be appropriately divided and applied. It is possible to pay too much for even gold, and it is possible to pay too high a price for immaculate housekeeping. The more we simplify our mode of living the easier does it become to live. There are those who prefer cobwebs in their houses to cobwebs in their minds, who prefer to polish their faculties rather than their silver, who choose embroidery for their intellects rather than for their garments, who enjoy elegant style in diction rather than in equipage. Those who have made their choice deliberately must not allow themselves to regret the absence of what they have not chosen.

A SERVICEABLE SLEEVE-HOLDER.

Any one who has experienced the discomfort of putting on one tight sleeve over another, will appreciate the simple and easily-made little article shown in our engraving. The opening in



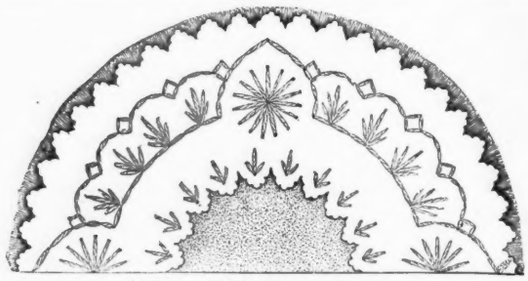
INEXPENSIVE SLEEVE HOLDER.

the end is put over the thumb; the cord is wound twice around the wrist, and the other opening is then put over the thumb. This holds the dress sleeve tight until the coat sleeve is on. It has great advantages over the metal ones that are sold, and can be carried in the pocket. A child can knit them, and the cost of the material is about ten cents.

Use No. 14 needles and Germantown yarn. Begin with two stitches; widen one on end of each row until there are sixteen on needle. Now cast off eight stitches, and knit those remaining back and forth sixteen times; cast these off, and knit the other eight same number of times. Then throw all together and knit back and forth, narrowing on each end until six stitches remain. This forms an opening to pass the thumb through. This is knit garter stitch. Now knit the six stitches, pearling every other one, to make the long part roll together like a cord, half a yard long, and then make another end exactly like the first.

PERFORATED FELT EMBROIDERY.

Our illustration shows one-half of a lamp mat worked in what is known as perforated felt embroidery. The design is drawn or stamped on felt, small holes are punched through the material at each angle, and at regular intervals between. The mat is made of tan-colored felt; the center is cut out, and it is pinked around the opening and also around the edge. The design is a very simple one; it can be easily copied, and is strikingly effective when filled in with the silk. A silk called rope silk, on account of its extra weight, is used to work this. It is of a dark rich shade of red, and the work is easily done by just carrying the stitches from hole to hole. Little tassels are made of the same material, and fastened under the points so that just the fringe is visible; these should be combed out to give them a fluffy appearance. A piece of red plush is glued under the opening in the center. Of course this kind of work can be varied according to taste and circumstances. Filoselle silk, crewels, or double zephyr could be used in place of the rope silk, sometimes combining them. Designs of various shapes



A FELT EMBROIDERY LAMP MAT.

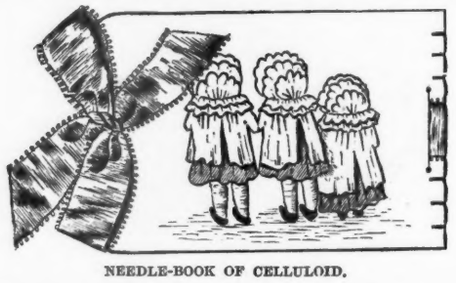
could be stamped or cut out, and with plush set under will be very effective. Select a pattern that has as many straight lines in it as possible. Beautiful sofa pillows, piano scarfs, and table covers are made in this manner with but a moderate outlay for material.

A CELLULOID NEEDLE-BOOK.

The cover of the needle-case seen in the illustration is made of celluloid, which comes prepared in thin sheets for decorative purposes; it can be cut as easily as paper, and a piece large enough for the cover costs about ten cents. The surface of this material is as smooth as ivory, and somewhat resembles it in appearance; it forms a beautiful background for oil painting. The little figures of the trio are arrayed in bright red dresses, dark red shoes, brown stockings, caps and aprons in shades of olive green. Slits are cut in each end of the cover, and a red ribbon run through, as indicated, and tied in a bow on one side. Several layers of red flannel are fastened between by the buttonhole stitches on the back. This is done with red silk, using a large needle for the purpose. Many pretty fancy articles are made of this material, as covers for glove, handkerchief, and card cases, calendars, napkin rings, and, in fact, it can be used for almost everything that cardboard was formerly.

SPRING BONNETS AND ROUND HATS.

As the season advances and milliners bring out more and more of their new shapes, it does not seem as though the spring bonnet was so very much lower after all, in spite of all predictions; but it has decidedly more brim, and the trimmings are arranged in a rather broader style, so that the effect of the whole is not so high as it has been. In the brim too lie most of the variations, one projecting like a scoop, another being closed to a point, while a third turns up coquettishly on one side and a fourth is thrown directly up in front like a shovel. The hollow thus formed above the forehead requires a cross-band of velvet, and is filled in with an inside trimming of small flowers, or of many loops of ribbon tied in a bow with two ends standing pertly upright. This face-trimming is also used



NEEDLE-BOOK OF CELLULOID.

on the new turban-bonnets, which are worn without strings and are a compromise between the old capote and the youthful round hat.

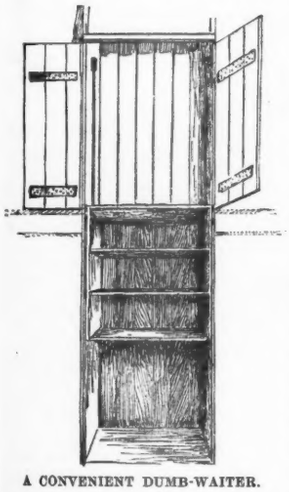
The Neapolitan and fancy open-work bonnets are pretty and youthful looking for young ladies, when lined with some delicate color, as shell pink or sea foam green, and trimmed with ribbon to match and a dainty bunch of heather or lilies-of-the-valley. With the fashionable grays there is a fad for combining ribbon of black and white check, put on in wide standing loops or an Alsacian bow.

The English walking hat is always liked for early spring, and is useful for traveling, excursions, and general morning wear all summer. Like the bonnet it has its variations, but the shape most preferred shows a tapering crown with an indentation on the top. The brim is faced with velvet or not, according to the taste of the wearer, but the trimming is much more elaborate and less masculine than it has been. This consists of multitudinous loops and ends of two kinds of ribbon—one generally being white—arranged up the front, left side and back of the crown. The white, however, only shows along the edges of the contrasting color.

Quaint little pokes, rounded or pointed over the forehead, are faced with a puff of some thin material, have a flat trimming around the crown, and long ribbon streamers behind. Large, low-crowned hats for summer, are either pointed on the right side, or else project straight out in front and are cut off close at the back. Some of them are most fancifully trimmed with a scarf of Brussels net a yard and a half long, doubled together and bound with narrow ribbon. This scarf starts by forming a bunch of loops on the front of the hat and passes to the back of the crown on the right side, from which it is brought down, wound around the neck, and carried from the right shoulder, to the left side of the corsage, at the waist, where it is fastened with a bow. Masses of flowers fill in the space on the left side and beneath the brim on the right. The style is picturesque but almost too pronounced to be a favorite, and most ladies will prefer folds of ribbon or gauze about the crown and tufts of curled ostrich tips.

A FARM-HOUSE "DUMB-WAITER."

The device shown in our illustration is one which will be readily appreciated by every housewife who has a cellar. A never-ending and wearisome part of household work consists of frequent visits to the cellar, where so many articles of daily use are necessarily stored. It is to obviate a large part of this labor that the present arrangement is designed by Mrs. David Tudor, Cambria Co., Pa., who furnished the sketch from which our engraving was made. It consists of four shelves firmly attached to side-pieces, and moving freely in a sort of boxing which extends from the bottom of the cellar to the ceiling of the kitchen or dining-room on the floor above. The shelves are of inch boards, each three feet long and fourteen inches wide. The side-pieces are each four feet long, and of the same width and thickness as the shelves. The upper and second spaces between the shelves are each fourteen inches in the clear, and the lower eighteen inches. The back of the "dumb-waiter" is of dressed and matched boards three-quarters of an inch thick, nailed on vertically. The boxing or upright slide in which the whole is enclosed is also made of matched lumber, surfaced on both sides. The front above the first floor is protected by doors, which may be made cheaply, as shown in the engraving, or, if desired, may be paneled. The latter would be preferable for a dining-room. The movable waiter is suspended by cords, one on each side running over pulleys near the top of the boxing. Counterweights are suspended to the other ends of these cords. The two weights should be a little heavier than the shelving. In our engraving the lower part represents the cellar bottom; the dotted transverse lines show the place of the floor and floor-beams above. The counterweights are hidden by the doors. The entire cost of materials need not exceed two dollars, and the device could be constructed by any man of average mechanical skill.



A CONVENIENT DUMB-WAITER.

A HOME-MADE KITCHEN TABLE.

J. F. Cass, of Skagit Co., Wash. Ter., sends us a sketch and description of the cheap and convenient kitchen table illustrated herewith. The frame consists of a box four feet long, three feet wide, and ten inches deep, made of dressed inch lumber. The legs are also of inch boards, cut tapering, and nailed or screwed on, as shown in the engraving. The box may be divided into two or more compartments, for flour, meal, sugar, etc. The sliding top is an inch and a half larger all around than the frame. It is made of dressed and matched lumber "blind-nailed" to the upper edges of two longitudinal slides, each three inches wide. Each slide has a tongue running its entire length, and sliding in a groove cut in the side-pieces of the box. The top is held in place by these tongues as it slides lengthwise, giving access to the contents of the box. The whole may be painted, and the top, if desired, covered with oil-cloth.

BAG FOR SOILED COLLARS AND CUFFS.

To make this pretty affair for soiled linen, requires a pink and garnet Turkish towel, and three-quarters of a yard each of pink and garnet ribbon to match shade of those in the towel. The towel is sewed together on the sides in a seam and turned, the top turned over, a place stitched in it to run a shir through—a piece of white elastic is best for this purpose. Sew the ribbons on the sides and tie them in a bow as seen here. This makes about as pretty and useful a gift as you can make for a friend, and the whole cost will not exceed fifty cents; the towel costing twenty-five cents, and the ribbon about the same. Blue and white and the cream and scarlet form pretty combinations for one also.

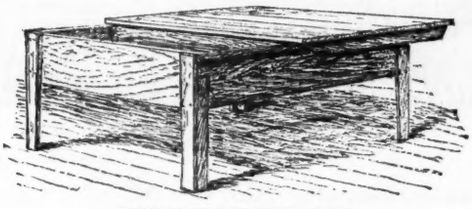
BAG FOR COLLARS AND CUFFS.

HOME RECIPES.

PARSLEYED POTATOES.—Peel, quarter, and wash as many potatoes as required, boil quickly in salted water until just tender, strain at once, and let them steam for a few seconds over the fire; add a liberal piece of butter and let it melt over the potatoes. Then strew over them some finely chopped parsley, cover, and taking the handle with one hand and holding the lid down with the other, shake the saucepan so that the potatoes turn over a few times, then dish at once. This is an excellent way of preparing old potatoes.

ALWAYS RELIABLE PIE-CRUST.—Weigh five ounces of fresh lard, half a pound of flour, take a pinch of salt, and not quite half a teacupful of very cold water. Put the salt into the flour, rub the lard thoroughly into it, and mix it quickly with the cold water into a dough, and roll out. This quantity makes upper and under crust for one large pie.

CORN MEAL WAFFLES.—It is during the spring that the waffle-iron is generally brought out from its temporary seclusion. If, however, the iron happens to be a new one, don't count on it to supply you with respectable waffles the first or even the second time. The chances are that only the chickens will profit by these bakings. We do not know of anything except use that will keep a new iron from sticking. It should be first boiled in water with potato parings and hay, and then greased and set in the oven to burn off. Repeat this operation several times, and then experiment some time when you have another dessert to fall back on. Don't spare the grease, but use plenty of butter or sweet drippings, and have it smoking hot. Very nice waffles are made from one cup each of corn meal and flour through which has been sifted one heaping teaspoonful of baking powder; add two tablespoonfuls of sugar, and a teaspoonful of salt; the beaten yolks of three eggs, and one and a quarter cups of milk; then the beaten whites, and lastly a tablespoonful of melted butter. If sour milk or cream is used instead of sweet milk, substitute a half teaspoonful of soda for the baking powder.



HOME-MADE KITCHEN TABLE.

BOYS' & GIRLS' COLUMNS.

IN THE MERRY MONTH OF MAY.

"May, sweet May, again is come,
May that frees the land from gloom;
Children, children, up and see
All her stores of jollity!
Sing ye, join the chorus gay!
Hail the merry, merry May!"

These lines are a quotation from a translation of some very delightful German verses, composed more than seven hundred years ago, by an old minne-singer, Earl Conrad of Hirschberg, and the whole song is redolent of the bright, bursting spring-time, when indeed the first of May was the

"Maddest, merriest day of all the glad new year."

Unfortunately, our Northern spring is apt to be backward, and too often, at this season, gives us a March wind or an April shower in place of a sweet May flower; but in the Southern States there seems no reason why young folks should not enjoy the charming old-fashioned "Mayings" of our grandfathers and grandmothers, and in many parts of the country such a scene as is represented in our illustration might delight the eyes of passers-by. What a blithe, happy little May-party they appear beneath the gnarled branches of the old fruit tree, twining garlands of fresh blossoms and crowning the favorite little maid as the May-Queen, or "May-ladie," as she was sometimes called, while her loyal subjects cluster about her feet, and even Frisky, the pet dog, sits up on his hind legs, as though to do homage to the little sovereign of the spring! There are few lands in which the month of May has not been welcomed with loud rejoicing, and the custom dates back to many hundred years before the Christian era, when pretty floral games were held in honor of Flora, the Goddess of Flowers.

Christianity changed many of the heathen practices, but the custom of celebrating the first of May spread far and wide. In poetic Germany, and even in bleak Russia, boys and girls haste to the woods on this day to gather the buds and green boughs and baby blossoms which have ventured to peep forth, while they dance and sing and greet with delight each cuckoo and lark and swallow, believing every bird, when it first appears in the spring, returns from Paradise and brings a little of its warmth to bless the frost-bound earth. The French, too, were formerly great observers of May-day; while in England, for many centuries, the May-Queen was a sovereign second to none during her one day's reign; May poles and May garlands were annual institutions; Robin Hood, Maid Marian, and Jack-o'-the-Green were familiar characters in the May-day pageants, and milkmaids and London chimney-sweeps especially bedecked themselves with tawdry finery and held high carnival at the great spring holiday. In Ireland, too, they had many odd, quaint customs; few of the superstitious girls venturing out of doors on May eve, or *neen na Beal tina*, as it was called, for fear of the fairies and brownies, who they believed had peculiar power on this night and were bent on mischief. But they were astir early enough the next morning to wash their faces in May-dew (it being considered a fine thing for the

CROWNING THE MAY QUEEN.

Drawn and Engraved for the American Agriculturist.

complexion), and gaily paraded the country-side with the youths of the village, all dressed in their best, and carrying a holly-bush decorated with hurling balls and gaudy streamers, while they were preceded by a bagpipe, or a fife, drum and tambourine, and accompanied by a clown wearing a frightful mask and bearing a mop which he dipped in pools of water and besprinkled the crowd that pressed in their wake.

It was a pretty, picturesque time, however celebrated, and as we look back to the "May-day" of which poets sing, we realize that the nineteenth century is a trifle too prosaic. It is a step in the right direction, however, that State Legislatures are considering the advisability of making the first of May a legal holiday, while for several years past school children of New York have held May parties in Central Park, although perhaps not on the regulation day; and since we have the Dutch Kirmess, the German Kaffeeklatsch, the Russian Fair, and the Fashing Thursday of Venice, it may not be long before we can enjoy a real May Festival of the olden time.

THE DOCTOR'S TALKS.

Some twenty or more years ago, I asked *you* (for you always seem the same youngsters to me, yet the "you" of 1864 are the fathers and mothers of to-day) to plant the seeds of several common plants. These were beans, corn, squashes, morning glories, and some others, which were planted in the "Boys' and Girls' Garden." You were to watch the plants in their growth, while I talked

Fig. 1.—FLOWERS OF THE RANUNCULUS.

about them from month to month, and a very nice time we had. Now, wishing to talk again about plants, instead of a garden, I shall take you to walk among

THE BUTTERCUPS AND THEIR COUSINS.

To make yourself thoroughly acquainted with the buttercups, you will be rather rude, and dig them up by the root. You will call to mind, what you probably already know, that buttercups, like most other plants, are fixed in the ground by their roots; that they have a stem which supports green leaves, and at the top it branches, each branch bearing at its end a flower, which is made up of what you probably know as flower-leaves. When the flower is a rose you call its parts rose-leaves. We wish to begin our examination with the flower, and we omit for the present the study of the

ROOT, STEM AND FOLIAGE,

asking you to notice that the root usually hides from the light, and is not green but whitish, and buries itself in the soil, serving to hold the plant in place, and to take up from the soil the food which the plant needs for its growth. Roots generally consist of a bundle of fibers, but we shall in time see that there are many other kinds.

ABOUT THE STEM.

In most buttercups, this arises from the root, and is erect, while there are at intervals upon it several green leaves. The lower leaves have *stalks* or *petioles;* while those near the top of the stem have no stalks, but are *sessile*, that is, sit directly upon the stem. At its upper part the stem branches, and at the top of each branch is a collection of leaves of a different kind from those on the stem, and called *flower-leaves*. Together they form the *flower*, being at first folded and forming the *bud*, which expands and becomes the flower.

ABOUT THE FLOWER.

We wish to examine the flower very closely and with much care, and to do this properly we must pick it to pieces or *dissect* it.

Fig. 2.—SEPAL, PETAL, STAMEN.

Fig. 3.—CARPEL AND OVULE.

Most of this work may be done with a small sharp pen-knife, but it will be convenient to have besides, one or two *pickers*, and a pair of small *forceps* or tweezers. Pickers may be made by mounting needles, a large and stout one, and one quite fine and delicate, in small handles. A piece of straight-grained pine, three inches long and whittled neatly to the size of a lead-pencil will form a good handle in which to insert the needles, pressing them in by the aid of a small pair of pliers. For forceps, unless you can find a cheap pair at a hardware store, you can make a pair without much difficulty. Get a piece of sheet brass half an inch wide, and six or eight inches long. Bend this over on itself, that is, double it up in the middle, and hammer the fold flat, so that the two ends will stand apart. You may cut the ends sloping to a point, finishing them with a file. The ends should not come to a sharp point, but be square, though very narrow. The brass should be thin, but thick enough to have sufficient strength. Mind, these are not absolutely necessary, but it is more convenient to have them; you can get along with the pen-knife. If you have an old knife, fit the blade to a wooden handle somewhat longer than the original one, and it will be lighter and much handier in use. Of course the blade should be kept very sharp, as you wish to cut delicate things, not tear them.

COLLECT SOME BUTTERCUP BUDS AND FLOWERS,

some of the branches with the flowers and buds upon them. It does not make any differenee which one of the many kinds you select. In some places the plants are called "King's Cup," "Gold Cup," or "Crowfoot," this last name from the shape of the leaf in some species. It was formerly supposed that the plants were called buttercup because the yellow flowers gave their golden color to the butter of the cows that ate the plants; but as the plants are acrid and biting when fresh, the cows always avoid them when growing in their pastures. The double-flowered buttercup is in French called *Bouton d'or*, or button of gold, and the name instead of being "butter" is button, and the "cup" is the old English for head, *cop*, and the name, originally button-head, was changed in use to buttercup.

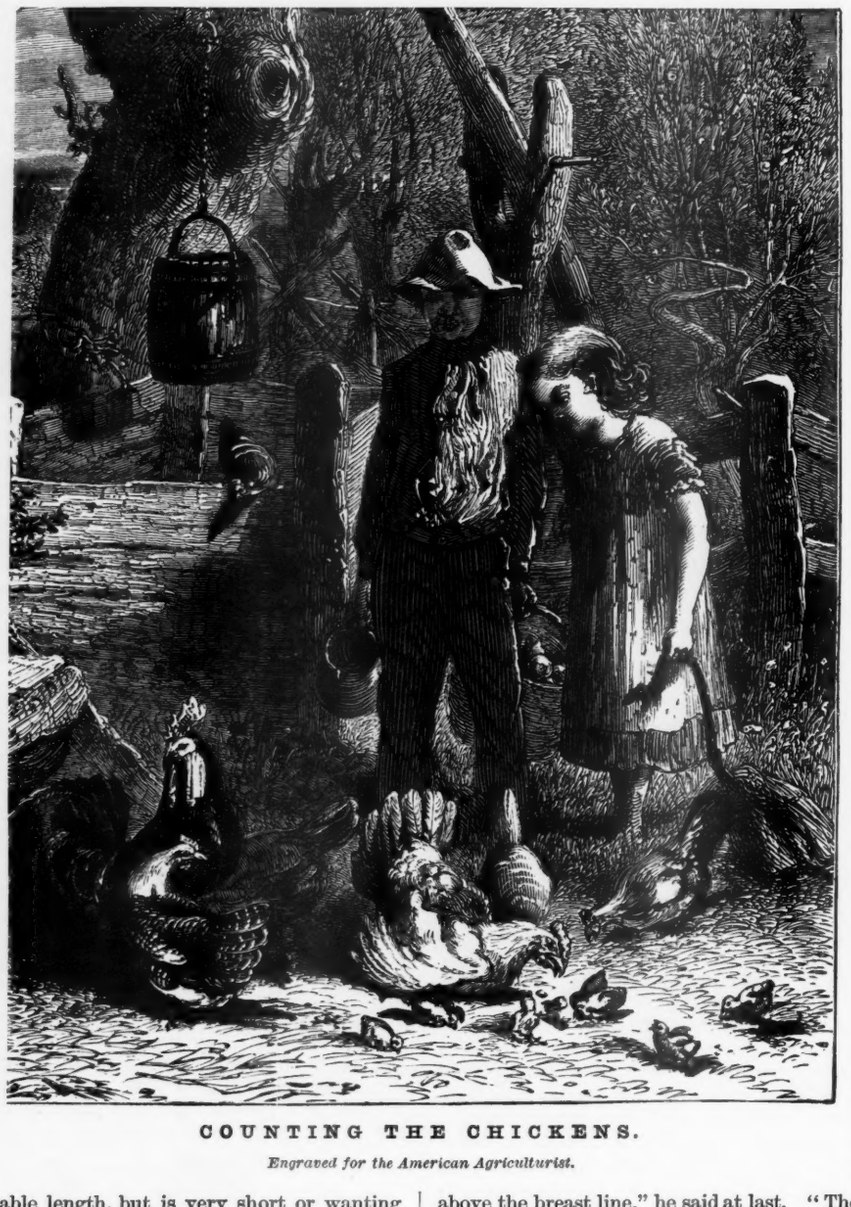
Looking at our buttercup flowers, we will see, as in figure 1, a lot of flower leaves, either expanded, or folded together in a bud. For careful examination select a flower that has not been open long enough to have lost any of its parts. You should have some kind of a magnifying glass; if you have the American Agriculturist Simple Microscope all the better. In looking at the flower from below, you will see that there are two sets of flower-leaves; the outer ones quite small and may be spreading, or turned back from the others, according to the kind of buttercup. Now carefully remove these leaves and lay them in a row, side by side, upon a plate or a piece of glass, as paper would cause them to dry and

Fig. 4.—FRUIT OF A BUTTERCUP.

curl up. There are five of them all alike, much the shape of the left-hand cut in figure 2. These together form the *calyx*, and separately they are calyx-leaves or *sepals*. Now separate the next set of flower-leaves, larger and shaped like the next cut in figure 2. There are five of these also, and together form the *corolla*, and each one is a *petal*. You will observe that these petals do not stand directly over the sepals, but are opposite the interval between two of them. These two series, the calyx and corolla, with all the other parts of the flowers, are placed on the end of the flower stem, which

is rounded off to receive them. You can see how this is by cutting down through the middle of the flower, using a very sharp knife or an old razor. You will see as at the left hand of figure 4 the end of the stem where the parts are attached; this is called the *receptacle*, to which are first attached the parts of the calyx, and next above these are the petals. Next within and above the petals is another set of flower leaves, which are numerous and quite unlike a leaf in appearance. These are *stamens*, and each stamen consists of a slender stalk, the *filament;* which has at its top a thicker oblong head, the *anther*. Figure 2, at the right, shows a stamen enlarged, as seen from the outside and the inner side. The anther, if examined closely, will be found to consist of two pouches, each of which has a slit or opening on the inner side. This slit is to let out the fine yellow powder which the anther produces, the *pollen*, the use of which will be seen presently. Under a strong magnifier the pollen will be found to be distinct rounded grains. Inside of the stamens, and crowded upon the very top of the receptacle, you find a set of bodies which appear even more unlike leaves than the stamens. Each one of these is a *carpel*, and if you can separate one and cut it through lengthwise, you will find it hollow and containing a roundish, pale-green body, which is the *ovule* (figure 3), and which in time will become a seed. Look at this carpel once more. The lower part is larger than elsewhere, and here it is hollow and holds the ovule, and this part is called the *ovary*. At the upper part of the carpel it is somewhat narrow, and near or at the very tip is seen to be, if strongly magnified, very loose in appearance, as if it were naked; this is the *stigma*. The carpels together form the *pistil*, and if there is but a single carpel, it is also called the *pistil*. The lower part, the *ovary*, and the upper part, the *stigma*, are always present. Often there is a stalk between these parts called the *style;* this may be of considerable length, but is very short or wanting in the buttercups. Look at your divided flower once more. You will have the lowest flower leaves, the calyx, of five *sepals;* next above the *petals*, the *corolla*, the showy part of the flower; those are together called the *floral envelopes*, which only protect the others, the stamens and pistil; which are the essential parts that are needed to produce seeds. The pollen grains are full of a thickish liquid, and they may adhere to an insect and thus be carried to the *stigma*, or is taken there in some other manner. When the grain is lodged upon the *stigma*, it breaks, and in some way its contents, a thick liquid, reach the ovule; when this takes place the ovule begins to grow, and becomes a *seed* that will produce a new plant. The ripened pistil, and whatever is attached to it, is called the *fruit*. Figure 4 shows a head of fruits; a separate fruit, and the same cut open, showing the seed within.

THE DOCTOR.



COUNTING THE CHICKENS.

Engraved for the American Agriculturist.

THE TURTLE'S COW.

HENRY NEWPORT.

"Here they come, Polly! But one more is missing." From his perch on the top of the wood-pile, Lige Bluebaker was looking down the lane leading to the cow-pasture, wherein his mother kept no cow, because she was too poor to own one.

"Are you sure? Count them again, Lige. There ought to be only nine, you know."

"Yes, I know; but there are only two, four, six, seven, eight—that is all. They are almost here now, and you can count them for yourself."

In a few minutes they filed in at the open gate of the dooryard, eight fine fat chickens; and as soon as Solomon—the magnificent white Leghorn in the lead—caught sight of Polly, with her basket of corn, he stretched out his neck and wings, set up a cackling, and half ran, half flew, helter-skelter toward her, followed by a straggling line of pullets and cockerels. They were muddy, tired-looking, and, judging by the draggled appearance of their feathers, had all been in a pond or stream of water.

"That makes four gone in three days," said Lige, coming down from his perch, and looking on thoughtfully while the chickens devoured the corn as fast as Polly tossed it to them.

"It isn't hawks," his sister said, "because there are no hawks about here big enough to carry off full-grown chickens. It must be a fox. But how do they get so wet and muddy? They wouldn't run into the water to escape a fox or anything else. Something must push them in."

Lige thrust both hands deep into his trousers' pockets and set his lips tightly together, as was his habit when anything puzzled him. "But they are never wet or muddy above the breast line," he said at last. "The feathers on their backs are as smooth and clean as ever, and if they were pushed or thrown into water, they would be wet all over. I'll tell you what I'll do!" He took his hands out of his pockets and brought his right fist down into the palm of his left hand with a smack that made the chickens jump. "I'll follow them to-morrow morning, keeping out of sight as much as I can, and I will find out how they get wet, and what it is that carries them off. I will ask mother to let me take the shotgun, and if it is a fox—why, I will carry him home with me; that's all."

These two—Polly and her brother—had seen their little flock of chickens grow up from a single pullet and setting of eggs in the year they had lived with their mother on this little Western farm. They remembered the late broods which had come out in September, and which had spent the first few months of their lives either cuddled in Polly's arms or huddled together in baskets behind the

kitchen stove. They could tell you how many had found their way, together with Polly's most appetizing pie-crust, into the oven of that very stove; how many had fallen by the wayside overcome with the pip, the gap, and other ailments of infantile chickenhood, and more than all the rest, how many had been sold to help pay the rent and to buy copper-toed boots, which would wear out notwithstanding the copper toes. They could tell you, also, that each chicken which was carried off by the unknown enemy was a quarter of a dollar stolen from their mother's thin purse. So they had good reason for the sober faces which they carried into the house that evening.

When the chickens started down the path towards the pasture on the following morning, as had been their custom every day for the past week, Lige with the shotgun was behind them. He dodged from tree to tree, and from fence post to fence post, keeping quiet when the Dominick rooster found a snail, which it divided with a great deal of bluster and clicking among its favorites, or when the whole party paused to dust themselves in a sunny spot. On the whole, however, the march was kept up very diligently until the pasture was reached and crossed. At this point, King's Creek—swollen out of its usual bounds by rains and melting snow—barred the way. The chickens walked to the edge of the water, and in five minutes were ranged in a line along its course, every one of them busy picking up from its banks flotsam and jetsam in the shape of insects and nuts which the full stream brought with it.

Lige got down on his hands and knees and crawled through the grass to a clump of pawpaw bushes not more than ten feet from the water, where he hid himself with the gun across his knees and watched. A sprouting beech-nut floated down the stream within two feet of shore. The Dominick looked at it, stretched his neck toward it as far as he could stretch, and then boldly waded out into the creek. He picked the beech-nut out of the water as calmly as though it had been on dry land. One by one the others stepped into the stream after him, and presently the whole brood was wading breast deep against the current. They were engaged in a mode of fishing very common with poultry which is required to forage for itself; but it was new to Lige, and he looked at them with an amazement which presently drifted into amusement. "I wish Polly had come," he thought, "this is as good as a circus." "Snowy," Polly's favorite pullet, was soberly wading beside the Shanghai cockerel directly opposite Lige's hiding place, and had just swallowed a dead minnow, when suddenly she went under the water. In a moment her head came into sight again and she began screaming in a high shrill voice which had something human in it. The other chickens dashed like mad things to the shore, while Lige gripped his gun and ran down to the water's edge. The pullet was beating the water into a foam with her wings, trying to break away from some invisible creature that had caught her by one leg and was slowly dragging her out to the deeper parts of the stream. Her whole body was under water now, but she kept up the painful screaming until it ended with a gurgle, when her head went under for the second time. Then everything was still. The surface of the stream was smooth and unbroken, nothing on top of the water giving evidence of the life and death struggle that Lige knew was going on beneath.

What was it that had dragged the pullet down? That was the mystery. Lige kicked off his boots, and was about to wade out to the rescue when the thought struck him that his feet might need some shield from a creature that could thus pull down a full-grown chicken, and he drew on the heavy boots again. The bottom of the creek was slippery; a short distance from shore the current ran like a millrace, and in his clumsy boots the boy had some difficulty in wading out to the place where poor "Snowy" had disappeared. When he reached it, however, the bottom of the stream at that point was bare. No body was to be found within a yard of the spot. But farther out in the water, and lower down stream, his right boot kicked against something soft. He stooped down, and plunged his hands under water. They touched the feathers of a chicken; but when he attempted to lift the bird it seemed anchored to the bottom. He slipped his hand along its body down to the point where the weight appeared to be, and distinctly felt the smooth head and neck of some living snake-like creature.

The unexpected encounter shocked him like grasping a snake in the dark. He dropped the pullet with a shudder, feeling for a minute as though he was about to faint. But he did not retreat. He kicked with his boot at the spot where he judged the animal's body to be, and struck a stone. He wrapped his handkerchief about his right hand, reached down with it into the water, and taking the hard substance by its lower edge, up-ended it. When the upper edge came above the water, Lige saw that it was not a stone, as he had thought, but the body of a large fresh-water tortoise or turtle. It took all his strength to drag the creature ashore; but he finally accomplished the feat by taking one of its hind legs in either hand, and carefully backing out, trailing the forefeet and head. When shallow water was reached, Lige saw that the turtle still gripped the pullet's leg with its jaws, and that the bird was dead.

A gayly-painted cart, brimming with bright tin pans, buckets, coffee-pots, and dippers, was standing before the house when Lige and his turtle reached home, and just as the boy dragged his prize past the lilac bush which cut off the view from the window, the peddler who owned the cart stepped out from the side door. He carried a bundle of rags under each arm, and was smiling as though he had made a very good bargain; but at sight of Lige's turtle he dropped the rags in amazement.

"Great Towser!" he cried, "that is the father of all the turtles ever I see. What'll you take for him?"

"Will you buy it?" asked Lige, quick as the snap of a steel trap.

"Yes, I will."

"Lige Bluebaker! what have you got?" suddenly cried Polly's shrill voice, as Polly herself came like a whirlwind out of the doorway and settled with a flutter of skirts at the side of the turtle lying on the grass. Her mother came close at her heels, quite as excited as Polly.

"It's a turtle, mother," explained Lige, "and the tinman wants to buy him. He is the fellow that has been stealing our chickens."

"Stealing our chickens?"

"Oh, yes, mum," interpolated the peddler, "they do that sometimes, and ducks too. They're right smart of a pest; and I'm doing you a real kindness when I offer you a cent a pound for him just as he stands—hide, horns, and tail. Come, now, what do you say? He must weigh as much as thirty or forty pounds. That means thirty or forty cents, and I'll pay it without turning a hair." He had his leather pocket-book in his hand, and before the speech was fairly ended had thrust a bright quarter of a dollar together with a silver dime into Lige's half-closed hand. It seemed a large sum of money for the slimy creature, and the boy looked at his mother, to see if she agreed with him in thinking it quite enough.

"That will not do," she said decidedly. "I remember reading in a newspaper that these fresh-water turtles are in great demand in the city hotels, where soup is made of them. Ten cents a pound is the price at which they were quoted."

The peddler's jaw fell. He stooped and picked up the bundles of rags, and without a word passed through the gateway, threw the rags upon the cart and climbed up to his high seat in front. He took up the lines and his whip, and then cast a glance out of the corners of his eyes at the little group gathered about the turtle. "She means it; switch me if she don't," he said to himself. "I thought she'd have called me back before this." Then he raised his voice. "Oh, Mrs. Bluebaker!" he shouted, "I tell you what I'll do, I'll give you five cents a pound for him just as he lays—hide, horns, and tail. Come, now." Mrs. Bluebaker shook her head. "Six." Another shake of the head. "Seven. No? Well, eight then. I couldn't make it more than eight—not by no means." This time the head was nodded in affirmation, and the peddler leaped down much more briskly than he had climbed up to his perch.

The turtle weighed exactly forty-two pounds and nine ounces, and when he counted the sum of three dollars and forty cents into Lige's hands, the buyer spoke a few words that made the boy feel that at last he had found a way to earn the money which they had all been hoping for ever since they had lived on the farm—money enough to buy a cow.

"You ought to make a regular business of turtling for money, boy," he said; "that creek of yours must be swimming with turtles, if they carried off four of your chickens in three days, as you say. No one turtle did that. A chicken will last one a right smart of time, and I calculate that four has had a hand in stealing your poultry. You will need to get a long-handled spade and wade in the creek, scooping out everything that feels to your feet like a rock, and you will be surprised to find how many of them is turtles. I will buy them all at eight cents a pound. I know a man over in King's Hollow that made from fourteen to twenty-three dollars every week for seven weeks last spring in that way."

Lige did not do so well as the man in King's Hollow; but while the season lasted he worked early and late at the wet and disagreeable business, and before many weeks had the proud satisfaction of seeing a little red cow—bought with money he had earned—ripping off the grass beside the stream. Polly used to moralize about the matter sometimes, and say: "If they hadn't killed our chickens they would be live turtles yet, and we wouldn't have had our 'turtle cow.'"

HARROWING AND ROLLING.

In the spring when farm work presses, and we are anxious to get in the seed, there is a constant temptation to sow or plant before making the ground as fine and mellow as our better judgment tells us is necessary. Patience is the greatest of all virtues; but with the farmer in the spring it must be an active energetic patience. After the crop is in he waits patiently. But before sowing we must be on our guard against the kind of impatience that results in hasty and imperfect preparation of the land.

Oats can be sown on land early in the spring without much harrowing, and we presume this is true of spring wheat. But barley requires the best of tilth, and the harrows must be kept at work till the surface is fine and mellow. Harrowing and rolling require more careful attention than is usually bestowed upon them. We do not roll to make the land firm. Harrowing will make the land firmer than it can be made, except on the surface, by a roller. We roll to break the lumps. The roller will not crush lumps that it cannot reach, and so we harrow to break some of the lumps and to pull the others to the surface, leaving it rough, and then follow with a roller.

There are fields which are of one uniform character throughout. On such you can put a boy on a roller and tell him to go round and round the whole piece till it is done, and so with harrowing. But there are many fields where we have sandy knolls with intervals of black muck or "clayey loam," or "sandy loam" or gravel, or "clay spots." To get such a field into the best tilth requires good judgment and personal supervision. We have had to go over some of these clay-spots three or four times with the harrow followed by a roller, round and round after each other, before they could be brought into as good condition as the rest of the field. To treat all alike is either a waste of time or a failure to bring the clay spots into the proper tilth. Great improvements have been made in harrows and rollers. The work can be done with far less labor than formerly, but there is still need for good judgment and for promptness. A field may work well to-day, that to-morrow, after a rain, would be damaged rather than improved by the harrow or roller. And part of a field can be worked while other parts are still too wet. We need to have everything ready, so that not a moment may be lost when the conditions are favorable for the important work of fitting the land for the reception of the seed. And do not fail to put in the seed as soon as the land is ready for it. It is rare that a farmer sows or plants too early in the spring.

Progress in South Africa.—The four principal divisions of Southern Africa are the Cape Colony, Natal, the Orange Free State, and the South African Republic or the Transvaal. The population and area are as follows:

	POPULATION.	WHITES.	AREA.
Cape Colony	1,000,000	300,000	Square Miles, 214,000
Natal	443,000	38,000	" " 21,000
Orange Free State	136,000	61,000	" " 46,600
Transvaal	360,000	60,000	" " 113,000

The commercial returns of these several divisions are as follows:

	IMPORTS.	EXPORTS.	RAILROADS.
Cape Colony	£3,799,261	£7,306,538	Miles, 1,600
Natal	1,654,000	745,000	" 220 narrow gauge.
Transvaal	391,437 est.	900,000	" 54
Orange Free State *	1,000,000 "	2,000,000	M., 1,010 telegraph. No RR.

Smuggling is a thriving trade in the Transvaal, and fully as many goods pass into the country without duty as with. The Cape Colony exports wool to the value of more than two million dollars, and its crop of wheat is more than three and a half million bushels. The region of which these countries form a part is, in general, favorable to agriculture, and the chief industries and exports of these colonies are ostrich feathers, gold and diamonds, wine, wool, cattle, hides, grain, ivory and butter. The export of diamonds from Cape Colony alone in 1886 was to the value of more than seventeen million dollars. For twenty years past the aggregate value of the export of diamonds was one hundred and eighty million dollars. The gold and diamond fields have been the source of increased activity for many years, and have encouraged a large emigration. The rush to these fields has stimulated disturbance and agitation that have resulted in sundry military movements or expeditions, each of which might be called a "war." The social revolution and changes in California and Australia, caused by the gold fever, were marked and rapid. In South Africa political relations and territorial arrangements were also effected. The next great change will be brought about by the construction of railroads, of which an extensive system is in progress in Cape Colony. Natal is also engaged in railroad building, and the lines will eventually be interlocked in the various governments, just as they are in the several States of our Union. Cape Colony and Natal are English speaking States. The Transvaal and the Orange Free State are Dutch speaking. Herein lies the source of present disagreements and dislikes, and herein, too, lies the channel that may lead to unity of feeling and action, and before many years create a powerful, populous, and wealthy combination in a part of the world rich in mineral resources, and capable of a vast agricultural expansion.

* Orange Free State imports and exports included in returns for the above named colonies.

ODDS AND ENDS.

Do not hurry the cows from the pasture.

Sow turnip seed after, not before, a rain.

It is not too early to begin on your fair exhibits.

Better have whitewash than manure on the sills.

Try hard to keep the stable dry during damp days.

The poorest land is too valuable to grow weeds or briars.

Reduce the amount and improve the quality of the fencing.

Pasturing meadows is like removing the door to stop a knot-hole.

More hoe is the best remedy for poor quality among vegetables.

Cultivate the mud-wasps—they are the sworn foes of the cricket.

Better miss a good trade than fail to praise your child's good deed.

Plows in the fence corner are a sign of "farm for sale" within ten years.

A mixture of grasses stimulates the appetite and affords better nourishment.

Buckwheat and sheep are most excellent help in renovating foul, worn land.

Empty the slops on a heap of dry earth under a shed near the house—not in a sink drain.

It was well-rotted chip-manure liberally applied that made the radish so sweet and tender.

The secret of transplanting sweet potato plants successfully is to firm well the soil about them.

If the children will despoil flowers and shrubs in the school-yards, their parents should blush with shame.

A weak fence, a pond near the house, a scrub male, or a lean manure heap, is not seen on a well-managed farm.

Having too many implements is as bad as not having enough; and having implements in bad condition is always bad.

A large per cent of merchants are ruined by the failure of other merchants; few farmers indeed lose by the failure of other farmers.

Put it down to the credit of the silo that at least it has shown farmers that their worst faults have not been in producing but in utilizing.

Plowing around stumps and rocks is not unlike driving slower to reach your destination sooner; yet the children would be afraid of you if you did the latter.

The farmer who thinks that to make money he must go where land is cheaper, should consider well if he would not make more money by making the land he has deeper and richer.

Holidays, Fair and Unfair.—So much has been said concerning the weather on holidays, and poor St. Patrick has such "a black eye" for regular unpleasantness, as well he might, from having his anniversary in March and close by the mythical equinoctial, while Easter, with its lilies, is always pronounced fair, that a recurrence to the real figures will prove of interest, and dispel some popular delusions. Below is a record for the seven chief holidays of the year for the past twenty-one years, 1868 to 1888. They are taken from a private memorandum book, the entries being made on the days signified. It appears that Christmas and Washington's Birthday took the first prize, New Year's Day and St. Patrick's the second, and that Easter comes in last. The record is, for New York City, except in a few instances, perhaps ten, when the observation was made elsewhere in the State:

21	New Year's Days	12	clear.	9	cloudy, rain or snow, or both.	
21	Washington's Birthdays	14	"	7	"	"
21	St. Patrick's Days	12	"	9	"	"
21	Easters	8	"	11	cloudy or rain, 2 rain in Ev'g.	
20	Fourths of July	10	"	10	cloudy or rain, at least ½ day.	
20	Thanksgivings	9	"	11	cloudy, rain or snow, or both.	
20	Christmases	14	"	6	cloudy or snow.	
144		79		63		2

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produces not only a saving of time and labor to the intelligent laundress, who without it try to make elbow-power and soap do what they seldom accomplished. It is a relief to the pocket of the master of the house, and the conscience of the house-mother. She feels herself to be personally responsible for the condition of the linen, which comes up from the weekly wash ill-smelling and dingy, or, if white, is eaten as by a cotton-loving species of moths into holes by washing soda, beloved of the lazy, abhorred by the thrifty. Pearline, used according to the directions, which accompany each package, softens hard water, extracts grease, bleaches "white goods" without damage to the finest fabric, and cleanses paint to perfection. In the decade that has elapsed since the introduction of it into American kitchens, the demand has steadily and rapidly increased, until, in 1886, 14,000,000 packages were required to supply the market; the demand in 1887 was still larger. This mass of truth-telling figures is eloquent and unsurmountable.

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Flower Garden and Lawn for May.

Sow grass seeds on thin places early....Plant ornamental trees and shrubs of the deciduous kinds early, leaving the evergreens until the new growth has started. More important than the date, is the actual prevention of the roots from dryness. When the resinous juice of a conifer once dries, no moistening will ever restore it. When a tree of this kind is taken from the soil, or from the damp moss in which it was packed, have at hand a wet cloth or garden sheet with which to cover the roots, and keep it moist until it is again covered by soil. Evergreens of large size should have the soil over their roots covered with large stones. These are better than stakes to steady the trees, and are a good mulch.....If there is any lack of climbers, plant the woody kinds early. Most pleasing home-like effects can be produced with them. Plant gladiolus, and other tender bulbs. Do not plant all at once, but put in a portion at intervals to secure a continued bloom.....Arrange and put the borders in order. If any of the clumps of perennials have become too large, lift them, and divide carefully and re-set. If bedding plants are to be planted, see that a sufficient number of each kind is provided. Such plants should be properly hardened off before taking them from the house.

Greenhouse and Window Plants.

Many greenhouse plants give much better satisfaction if kept in the house during summer; of course they must be shaded, ventilated, watered, syringed, etc., with even more care than in winter. A collection of *Gloxinias*, and others of the *Gesneriaceæ*, make a grand display, and are fine for summer culture in the greenhouse or window.....Do not place house-plants outside until cool nights are over. Set in partial shade, but not under trees, placing the pots on a layer of coal-ashes, and see that the plants may not be injured by dogs, cats, and other animals. Propagate new plants of those already overgrown or likely to become so. Balcony gardens in cities are apt to suffer if the owner goes to the country in summer, especially if left to the care of the servants. It will be much safer to engage a florist to be responsible for their care.

Bee Notes for May.

A. H. DUFF.

Successful production of comb honey depends upon care in every detail. The prime requisite is to have the bees in proper condition. The first step in spring is to prepare each colony for the harvest, and to do this properly operations must begin as early as possible in spring. Every beekeeper knows when to expect the honey harvest, and building up his stocks is of prime importance. It is useless to look for a rich harvest of honey from weak colonies, and as the heavy flow occurs generally in June, if the beekeeper does not bestir himself he will be caught with many weak stocks. Daily stimulative feeding will secure colonies strong in numbers, with a powerful force of willing laborers, ready to gather the honey harvest at any moment it presents itself. There are various forms of surplus honey receptacles, such as section cases, section boxes, etc. Section boxes are the most desirable receptacles for comb honey, and are used now exclusively by all advanced apiarists. They vary somewhat in size, holding from one pound to two pounds each. The one pound is principally used, and is considered the most salable in the market. It has become the general rule in preparing these section boxes to fill them entire with foundation comb, instead of using mere starters as heretofore. Much better results are obtained when filled thus, as it does away with separators, which are necessary to a guide in comb building if starters only are used. Some apiarists adhere yet to separators, even when sections are filled with foundation, but we find no use for them. Separators are barriers to comb building, especially if the weather is a little cool, as they divide the cluster of bees in small groups. Section cases or crates are used for holding the boxes. We prefer those which hold but a single tier of sections, arranged so that a second tier or any number of tiers can be placed one above the other. This tiering-up process is one of the most important matters in raising comb honey. It is better to have no bottom in these crates, but merely rests for the ends of the section boxes; nor to use any honey board over the hive, but to get the surplus section as near the brood nest with as little material between them as possible. Some object to exposing the bottom of these boxes to the bees, which soil it; but much weaker colonies can be induced to occupy the surplus boxes when but little material is used to separate them from the brood chamber.

The opening of the honey season is the only proper time to put on surplus boxes, providing colonies are strong enough to occupy them. If not, keep them off until the bees are ready for them. In managing these crates, we would use but one tier at a time, and after they are near half full of comb and honey add another, but never put it on top of the one being filled. Raise the full one and place the empty one under it. In this way the bees will occupy the whole double tier at once. A third or fourth tier may be used, but we prefer two only. Do not let those two tiers of boxes remain untouched and regard the work as done. But strict attention must be given to remove all sections just as soon as they are completed, and add empty ones, always keeping the ones nearest full in the upper tier. If the colony becomes so strong that two tiers will not accommodate them, add a third or as many as will give them working room.

Florida Sub-Tropical Exposition.

P. W. REASONER, FLA.

Few things connected with the Exposition surprise Northern visitors more than the display of farm products from various parts of Florida. There appears to be a class of people who expect nothing from Florida but oranges, and they actually think nothing else can be grown in this State. Of course there is the usual display of farm products, grown as readily in Florida as elsewhere, perhaps some of them more so. This embraces bales of tobacco, cotton, oats, sugar-cane, sugar and syrup, corn, rice, peas and beans of every description and variety, peanuts, chufas, sweet potatoes, and a general line of garden vegetables in the greatest variety. Hay and dried forage grasses, as well as butter, canned products, etc.

Among vegetable products that are not often seen on exhibition are specimens of the so-called "air-potato" or "Indian potato" (*Dioscorea tuberosa*), a native of Martinique. The "potatoes" in question are large axillary bulbs of irregular shape and size, but usually two or three inches in diameter, of a brownish color, and often with irregular projections or "fingers" on the sides. The vine itself is not unlike some species of *Ipomœa*, or morning-glory. These are exhibited by Maj. O. P. Rooks, of Lake Co., and Mr. Keck, of Polk Co. Another interesting and but little known vegetable that is on exhibition is the *chocho* or *chayote*, the fruit of *Sechium edule*, a cucurbitaceous plant, native of South America. It is an annual vine, requiring the support of some trellis, and, so far as soil is concerned, can be grown anywhere where good cucumbers can be produced, provided the season of warm weather is long enough. They have been grown occasionally throughout the Southern States for twenty years or more, and were sometimes seen in the Charleston market—as they are now in the markets of New Orleans—before the war. The fruit somewhat resembles an irregular pear-shaped squash, of a greenish-white color; the surface is covered with rough ridges, and the single large seed projects from the stem end of the fruit, often germinating long before the fruit is planted in the spring, and even attaining a growth of a foot or more in this condition. The chayote is cooked in about the same manner that egg-plant is prepared, and is a most delicious vegetable. In the markets of the West Indies it is sold in great quantities. Whether the chayote could be grown so as to perfect its fruit in the North is still an undecided question, but still one that is being tested this season.

There are great numbers of starch-producing roots on exhibition, particularly those of the cassava (*Manihot Aipi*) and the true arrow-root (*Maranta arundinacea*). Some remarkably fine specimens of arrow-root are shown in the Marion Co. exhibit, several of the tubers seven or eight inches in length, and an inch and a half in diameter. The arrow-root is at home in Florida, and produces remarkably good crops. There are samples also of the "Florida arrow-root," or "*coontie*," the underground stem of *Zamia integrifolia*. This plant is a true Cycad, a native of Florida, from the hommocks of Alachua county to Cape Sable and Miami. The stem (or "root," so-called) is rich in starch, which has been prepared in considerable quantities by a company at Miami, Biscayne Bay, Dade Co.

Monthly Crop Report.

WASHINGTON, April 12.—The April statistical returns to the Department of Agriculture relate to the condition of winter grain and of farm animals. The season for seeding was long, three months in some of the Southern States, and the appearance as winter set in was uneven, though the plants were rooted. In the States affected by summer drouth there was slow germination in soils not well pulverized, causing thin stands in such areas. Later rains improved the prospect. In the South the soil was in good tilth, and full growth generally good. In the Middle States the seeding season was moderately favorable, though in some places the soil was dry. In California, with some exceptions, a very favorable season for seeding and germination is reported. Drouth in Oregon delayed plant growth. Only partial winter protection was enjoyed in the Northern belt. The variable temperature of March seriously injured the plant in the Central States of the West, and some loss from winter-killing appears even in Texas. On the Atlantic Coast the winter injury was very slight. South of Maryland the temperature was mild and favorable.

The present appearance of the crop is quite unfavorable. As the spring is late, and present growth of late-sown comparatively small, favorable spring weather might make material improvement. The average of present condition is 82, lower than in recent years, excepting only 1883 and 1885, when the averages were 80 and 76 respectively. The averages of the States of principal production are as follows: New York 94, Pennsylvania 90, Ohio 68, Michigan 76, Indiana 75, Illinois 74, Missouri 82, Kansas 97. The average of Texas is 88, and of most of the Southern States higher, from 87 in Arkansas to 97 in Tennessee, though the area seeded is small in all this region. The condition of rye is much higher, standing at 93.5 for the entire breadth.

The condition of farm animals is comparatively good. There has been some disease among horses, and hog cholera has been somewhat prevalent during the past year in its usual habitat. The estimated losses from disease and casualties are averaged as follows for each 1,000 animals: Horses 18, cattle 29, sheep 46, swine 78.

The Shropshire Record.—Volume Three of the American Shropshire Sheep Record has been issued by the Association. It contains two thousand and fifteen pedigrees, and carries the record of pedigrees from No. 2,609 to No. 4,626. The pedigrees, the list of members, and other information are arranged in a manner which reflects much credit upon the editor and secretary, Mr. Mortimer Severing, La Fayette, Ind.

De Bary and Planchon.—Death has been busy among European botanists, as well as among our own. Dr. A. De Bary, of the University of Strassburg, Alsace, who died a few months ago was so eminent in the minute anatomy of plants that he attracted students from all civilized countries. Profs. W. G. Farlow, of Harvard, and J. T. Rothrock, of Pennsylvania, are among the Americans who are proud to have been among his pupils.....Prof. J. E. Planchon, of Marseilles, France, was an industrious, systematic botanist, who elaborated several orders for *De Candolle's Prodromus*. He was skilled in other departments of natural science. He was delegated by the Department of Agriculture of France to visit this country several years ago, to investigate the ravages of *Phylloxera*, and visited the States from New England to Texas.

Answers to Geographical Charade in April number.—Springfield, Tombigby, Yellowstone.

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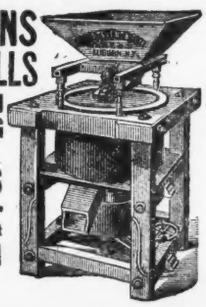

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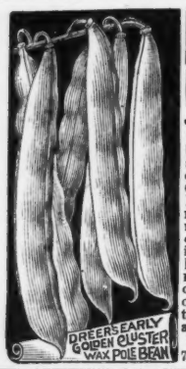

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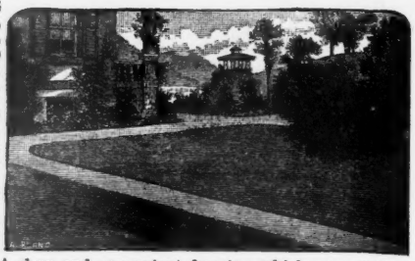

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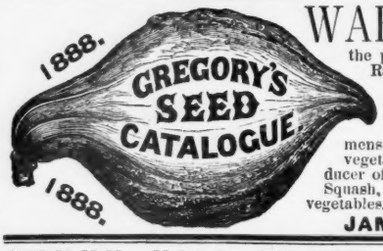

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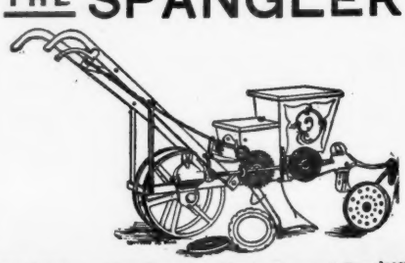

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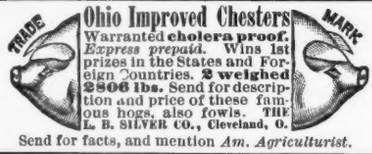

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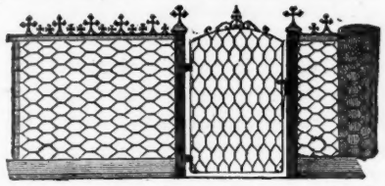

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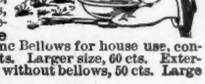

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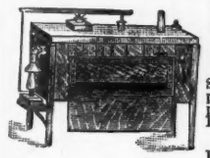

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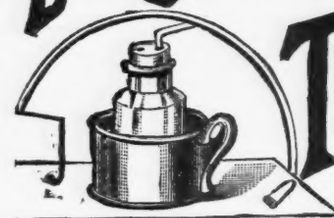
There is no sound! No apparition! And yet, we wake! We gasp for breath! A startling rasp is in the Throat! A tumult in the chest! What is it?

ASTHMA!

Have you suffered for years and found no relief? If so, you haven't tried

DRS. STARKEY & PALEN'S TREATMENT BY INHALATION.



NOT A DRUG.

Asthma! It sounds, in a degree, as it feels. Its sibilance is as disagreeable to the ear as the disease to the parts affected. Its spasms are suffocating. They wrench the briefest speech with wheeze and gasp, and turn the hours of repose to a period of torture and alarm. Let us examine the passages they obstruct.

Imagine the *wind-pipe* to be prolonged, divided and subdivided into multitudes of minute ramifications which penetrate every part of the lungs—each one terminating in an air cell. It commences as a ring structure and so, through the tubes, continues to the end. In the beginning the rings are hard, stiff cartilage, which in their extension towards the air cells grow flexible and conclude, in their minute tubes, in muscular fibers.

We are now prepared to understand the nature of the change in this part of the breathing organs which causes Asthma. On account of some disordered condition of the nervous system in general, and of the tissues of the respiratory organs in particular, *the circular muscles of those fine tubes are thrown into a tonic spasm;* that is, they are continuously contracted, like the muscles in the limbs during cramp. This spasmodic contraction produces an effect similar to that of a ligature tied more or less tightly around each of those minute tubes. *This is an attack of Asthma.*

The prevalent treatment of this disease consists in the administration of anti-spasmodics, which are principally powerful narcotics. Their action is to put to sleep or deaden the over-excited muscles with which they come in contact. Hence the sufferer is made to inhale narcotics, reduced to either vapor or smoke. So by partially deadening these muscles the spasm yields, the muscles relax, and a temporary relief comes to the sufferer. But what is the nature of this relief? Is it curative? No. Is it simply harmless? By no means. Some (if not all) of the drugs used if given to a well person, would cause Asthma. So the present relief is produced at the expense of future and greater suffering.

An enlightened treatment calls for a remedial action which will *eradicate the predisposition to the spasmodic action of these muscles;* not merely deaden the spasm temporarily and leave the predisposition as strong as ever. This we believe the Compound Oxygen will do in every case not spoiled by the vicious treatment to which we have referred.

That we have very good reasons for this belief is best evidenced by the experience of some of those who have found in our treatment a permanent cure.

"CRAFTON, WISE CO., TEX.,
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"You have never asked any statement of my experience with your Treatment, but I feel it my duty to you and to suffering humanity to tell you what it has done for me. I have delayed writing this in order not to be deceived myself, or to deceive others, in announcing my cure prematurely; but after waiting something over a year, without the slightest symptom of a return of *asthma*, I think that I may speak. I am now in good health; my weight is one hundred and fifty-six pounds, and my age forty-two. Nine years ago I began to have attacks of Asthma; I had tried fumigation and all the other domestic remedies that I could hear of, and the best physicians I could get, all with the same result—very little relief at all. Year by year my sufferings increased; the whole winter of 1884, I was so bad that I could get no rest; either had to sit all night in a chair, or lie in bed on all-fours, as this was the only way I could breathe at all; had a terrible cough all the time, and had bad colds; was never without them in spite of the best care I could take.

"It was a living death to me all the time. I had lost hope of being cured, and was so tired of *suffering in the furnace of asthma.* I remained in this way until, the first week in September, my sister came to visit us, and knowing my conditions and my husband's afflictions, brought with her about one-third of a Treatment of Compound Oxygen for us to try, which we did. We began taking it according to directions; about the second inhalation caused me to get hoarse, and to feel a soreness in my throat and upper part of breast, which lasted several days. I began to improve from the first, and in one month my cough was gone, and so was the difficult breathing, but I wheezed at night, and was spitting up a quantity without any effort at coughing at all; it would fill my mouth while asleep, and wake me. I kept spitting off freely till this summer, though not so freely towards the last. After that it gave me no more trouble, and I could breathe as free as ever I could in my life. My little boy has been subject to sore throat all his life, and we give him the treatment by inhalation, and he has it no more. I never can begin to tell you how thankful I am for my cure. If you should wish to use this or any part of it, you are welcome to do so. With many good wishes for you, and thanks for your kindness, I close.

"Gratefully yours,
"MRS. MARY M. HARGROVE."

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"I feel truly Compound Oxygen *saved my life*, and nearly four years have passed since I came to you in such a distressing condition, and to-day I can truly say I am *entirely well* and free from *Asthma*, and every symptom that pertains to it.

"Have half a bottle of the Treatment by inhalation as a pleasant reminder of its good work, but never expect to need it again. I am sincerely,
"MARY Y. HEDGES."

"Now, after three years' trial of the Compound Oxygen Treatment, I can say that I think it has cured me of the asthma. It breaks up every cold, and it has done me so much good that I do not intend to be without it. I am sure, if people only knew its value, every family would buy it, as it would save twice the amount that would be paid in doctors' bills.
"MISS EMILY ROBINSON,
"Keene, N. H."

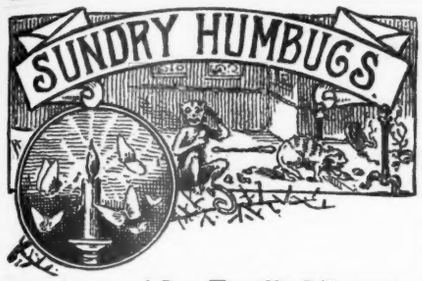
"RUSHTON, LA., March 3, 1887.

"I write for another bottle of your Compound Oxygen. I have used two bottles in the last two years, and find that I have been greatly benefited by its medical virtues. In fact I feel that my health is almost restored, as I wrote you in my first letter that I had suffered for several years with *lung affection, asthma, bronchitis, etc.;* also had a long spell of *catarrhal fever*, which lasted me some forty or fifty days, just before I commenced your valuable remedy. I have been very slow to catch on to those cure-alls, as we see so many hundreds and thousands advertised in the papers, but I can truthfully testify that your Treatment by inhalation is a most excellent medicine for lung and throat diseases, such as mentioned above, and I might further state my general health has greatly improved. "L. M. KIDD."

"CHULAFINNEE, ALA.,
"March 5, 1887.

"It is now six weeks since I commenced the use of your Compound Oxygen Treatment, and with the exception of the slight attack I wrote you about in my last latter, I have had no *asthma*. I am feeling quite well, *sleep* well, appetite somewhat improved, can get up hill now without puffing, and I have lost one little companion who has not forsaken me before for ten years. I know he, she or it is gone, because I don't hear the whistling with which I was constantly reminded of its presence. I am doing as well as I reckon any one could wish to. Shall continue the use of the Compound Oxygen. Will order again soon. *Have already been paid ten thousand times for the expenditure.*"
(Name sent, if desired.)

For further information as to the effects of the Compound Oxygen on Asthma, Consumption, Bronchitis, Dyspepsia, Catarrh, Hay Fever, Headache, Debility, Rheumatism, Neuralgia, and all Chronic and Nervous Disorders, send for the Brochure, an interesting book of 200 pages, published by DRS. STARKEY & PALEN, No. 1529 Arch Street, Philadelphia, Pa., 331 Montgomery Street, San Francisco, Cal., 58 Church Street, Toronto, Canada, which they will send free to those desiring it.



Humbugs with a Family Likeness.

Notwithstanding our long-continued and often-repeated cautions in regard to the sensational promises of speculative circulars, we are in daily receipt of new complaints and new appeals for the protection of the unwary. The "cure all" medicine dodge is the one that is worked most freely, and generally with reference to nameless complaints, or to the entire catalogue of ills that flesh is heir to. So we say to W. R. Y., of Frederick Co., Md., that he acted wisely in not sending for the medicine for which he wrote, after he had received notice that if there was no cure there was no pay. Mr. Y. could hardly expect to procure any remedy for nothing, but in this instance the circular would seem to indicate that the promise was altogether better than the performance.

H. W., of McLennen Co., Texas, ought not to be surprised that the firm whose pamphlets he sends us is not mentioned by the Commercial Agencies. The last thing that such concerns desire is publicity or investigation. The very nature of the pamphlet sent points out the characteristics of the establishment, and stamps its proposed remedies not only with suspicion but as objects of public reprobation. It is not necessary for us to give any further investigation to this matter, as the fraud is palpable on the surface.

The Louisiana Lottery and a Victim.

M. DeB., of Erie Co., N. Y., is anxious to know what the *American Agriculturist* thinks of the Louisiana State Lottery, located in New Orleans. Whether it gives a straight and impartial drawing as is affirmed by the Managers, or whether any opportunity is given to cheat. It is generally supposed that the New Orleans lottery is about as fair a lottery as can be found anywhere; "as fair as they make them," so to speak. It has the endorsement of the people of the State of Louisiana, is protected by the State Constitution, and has men of high character among its managers.

Richard A. Proctor, astronomer and mathematician, in a recent article, says that the object of the Louisiana Lottery "does not prevent the State-supported lotteries" of that commonwealth "from being conducted on a system whose only claim to fairness lies in the barefacedness of its unfairness." Mr. Proctor is the author of a small work on "Chance and Luck," in which the "prospects" in lotteries are discussed and treated from a mathematical point of view, and with reference to the calculation of chances. He shows that a lottery in England, which is called the "National Prize Competition Society," makes the usual proportion of profit for the lottery conducted by them between eighty and one hundred per cent. At the same rate, he declares, the Louisiana Lottery Company get the better of their foolish victims. This "Prize Competition" society in England is advertised as "a novel system for money making;" a system of profit in which the public have no part, as the society attends to that branch of the business. It is the old game under a new form, calculated to delude the weaker sort of people quite as completely as if it were altogether new.

Public sentiment, for the very best of reasons, condemns lotteries. It is useless to say that a few years ago, within the memory of men now living and active, lotteries were authorized and encouraged for educational and church purposes. It is sufficient to say that day has passed, and with it a multitude of once tolerated evils. Our correspondent thinks we may say that no lottery is honest, and that any one who invests a dollar with the idea of obtaining several thousand dollars should lose. He thinks the world itself is somewhat of a lottery wherein one investment increases rapidly, and where another collapses or depreciates. He admits that he has invested money freely during the last year, month after month, that he has drawn a few small prizes, but still he is "in a hole," hoping to be lifted out by the time the next drawing comes, and then strike a portion of the grand capital prize. Thus far he says "sweet fortune has not smiled on me." Our correspondent evidently has the lottery fever bad; he thinks if the game was played fraudulently he would never invest again, but if it was played square, he would play it all his life and blame nothing but his own poor luck. Now that is precisely what nine hundred and ninety-nine men out of one thousand who invest in lotteries continually experience. It is the common lot of such men to lose; the more frequently they lose the more anxious they are to go in again. There seems to be a fascination about it, which is like the temptation of gambling in other forms, like the temptation of drink, like the other hundred temptations that allure young people to destruction. This lottery is fair as lotteries go, but they are all an unmixed evil at the bottom. They are designed for a certain purpose, the calculations are all so made that very few of the prizes can be drawn, while at the same time, enough are given out to keep alive this restless curiosity, and to stimulate the little demon of avarice until he can never be satisfied, except by repeated indulgence.

Our correspondent sends us tickets, circulars, and engravings from the lottery, all of which have a very fascinating appearance, and are calculated to deceive the unwary. His own experience comes in as one of the strongest arguments that we could make against indulgence in this practice. He puts up his money regularly and loses it. Occasionally a wretched little prize drops in on him, and when the account is summed up at the end of the year, he finds himself very far behindhand, the victim of his own passion and folly. If he would communicate with others who have engaged in this same lottery, and undertaken to wrest prizes from fickle fortune, he would find that their experience tallied with his. It is loss and danger, and worry and sorrow, on the one hand, and nothing in the world to compensate for all these woes. Therefore avoid all lottery tickets and policy playing. They are a delusion and a snare, and the spendthrift who throws away his money in this way deserves no compassion. With his eyes wide open he is deliberately his own worst enemy.

The Same Old Coon and the Same Old Tune.

"Bohemian Oats" have done their evil work among credulous farmers. No part of the country has suffered more from this humbug than Michigan and Western New York, and now another brand of oats, called the "Early White Scottish Oats," is in the field with a most tempting array of promises; one hundred bushels to the acre, two hundred with good luck, and prizes of one hundred dollars and fifty dollars to those who raise the largest number of bushels to the acre. The oats as seed are "dirt-cheap," only fifty cents per pound, and eleven dollars for five bushels. Farmers had better take the advice of the *American Agriculturist*, and have nought to do with these schemes.

Three correspondents—one at Suspension Bridge, one in North Carolina, and one at Ringville, Pennsylvania—make inquiries in regard to the Florida lands offered for sale by the "People's Homestead Company." We noticed this concern in our February number, and have had hosts of inquiries since. We have made a careful investigation of this matter, and have sought information from parties to whom the Company refers. One thing is certain, a person contributing twenty-five cents will receive a "Warranty Deed Option Bond," entitling the holder to certain land. Then comes a request for two dollars and a half, as the cost of a full deed and recording it, or something to that effect. What follows this we cannot say, and we would not recommend anybody to make the experiment, or try the "leap in the dark."

We are in receipt of a letter from Carlwick, Ohio, from a correspondent who has written us heretofore on the same subject, and who makes some inquiries in regard to the "Harlem Flats Scheme." He informs us that in spite of the warning given in the *American Agriculturist*, and by letter to many individuals, investments in this Harlem scheme are quite popular in his county, and that many are "going in," as he expresses it, to the scheme to the tune of twenty-five dollars each. The fresh inducement to this is the speculative talk as to the completion of a ship canal from the Harlem River to the North River, which it is asserted will add immensely to the value of the flats. We are inclined to think that the flats (with a little "f") who invest in this enterprise will find that neither the ship canal nor anything else will save them from loss. The scheme may be made attractive and tempting in the highest degree. It has a pleasing prospect of we do not know how many millions of dollars, but if anything is realized from it, it will be as the ancients used to say, after the Greek Kalends, whose date will coincide very exactly with the materialization of castles in the air or the possession of *châteaux* in Spain.

A correspondent at Otterbourne, Kansas, writes us concerning a pair of "magnetic insoles," which he received from a Chicago company, by which great professions of doing good are made. If he had sent us more of their circulars we might have understood the matter better; but it appears he received from them insoles which he regarded as worthless, and which to say the least were no better than an insole that he might have cut out of felt or thick brown paper, which, if placed between the stocking and the sole of the shoe will prove a good preventive of cold or damp feet. Our correspondent lost his money and his temper, and is quite willing to regard himself as having been imposed upon. He evidently was tempted by the word "magnetic," which has as great a charm for most people as the word "electric." It is the custom of people who advertise things that are often very common, to attach imposing names to them, and thus deceive even the very elect. The words "Oriental," "Arabian," "Sicilian," "Hesperian," and similar terms, are employed in the same way. High sounding phrases, which catch the ear, and pictures which deceive the eye are also tricks of this sort of trade.

In June of last year the *American Agriculturist* called attention to "Moscos," a "Peruvian Catarrh Cure," and gave its opinion, which was not favorable, upon alleged remedies and specifics, the claims and pretensions of which are made public, as those of "Moscos" are. The ingenious promoters of this medicine have taken a few sentences from the remarks in the *American Agriculturist*, and by omitting a few words, and introducing stars (* * *) in their place, have contrived to make for themselves an almost complimentary notice, which they display upon the little pamphlet issued by them to proclaim the virtues of their "cure." This is quite enough to show that the "Peruvian Catarrh Cure" has not a leg to stand upon, inasmuch as it has betaken itself to such fragmentary and shivered crutches.

A Word to the Bald-Headed.

A correspondent in Myersville, Md., writes us that he is bald, and being bald, responded to the advertisement of a man in New Haven, Conn., who claims to have an infallible remedy and a sure restorer for the lost locks. Our correspondent sent to New Haven for the rejuvenator and found that before he could get it he must hand over five dollars. He believes he has had a narrow escape, and he desires to warn the noble army of bald-heads against this newly discovered foe to their peace. The circular sent our correspondent has, for an effective introduction, two heads, "before," and "after"; the one as smooth and hairless as a billiard-ball, the other with a mass of hair that would awaken the envy of a dude. One remarkable discovery is that away down in the depths of the skull integuments there are lying the dormant roots of a once proud crop of hair, and that the only way to a restoration of lost beauty is by a subsoil process to start the roots, and once started and on the surface, then to fertilize the new hair growth. The promoters of this scheme claim to be able to do this, and there are those who believe their preposterous claims and send in their five dollar bills; which is dirt-cheap when the fact is considered that they might have charged twenty-five dollars—and not got it. Wherefore they cry aloud to the bald-headed, Come over and help us and we will do you good. Trust to none of these things or none of these people. You might as well go back to the days of our Saxon ancestors, who paid much attention to the hair, and who had three remedies for three different conditions of the head. According to the old records, "they discovered that dead bees burnt to ashes and seethed in oil with leaves of willow would stop hair from falling off; should the hair be too thick, then must a swallow be burnt to ashes under a tile, and the ashes be sprinkled on the head; but in order altogether to prevent the growth of hair, emmet's (ant's) eggs rubbed on the place are found an effectual depilatory; 'never will any hair come there.'" If any of our readers are tempted by the New Haven circular, let them ponder on the ancient Saxon remedy, in full faith that it is quite as good as any of modern date.

CAUTIONARY.

In the January and February numbers of the *American Agriculturist* appeared an advertisement of the "New York Standard Pants Company." When this advertisement was offered to us, inquiry was made in regard to the character of those who were responsible for it, and the publishers were satisfied that the house offering the advertisement was sound and trustworthy. We have received a complaint from a correspondent in Kansas, who has sent money to the "New York Standard Pants Company," and has received from them no replies and no goods. Inquiry made since the receipt of this letter has shown that the concern has moved from its old location, to what place we have not been able to ascertain. We caution our readers against answering the advertisement in question. No one can regret more than we do the deception that has been played in this case, and it is comforting to know that this is the only black sheep among our advertisers that has shown up for many years, and we trust it will be the last. Our readers will not mistake the concern above-named for the "Plymouth Rock Pants Co.," of Boston, an old reliable advertiser.

Offer Extended for Thirty Days.

EIGHT NEW AND STANDARD WORKS.

To every subscriber, new or old, to the AMERICAN AGRICULTURIST for 1888, whose subscription is received by us within THIRTY DAYS, at $1.50, and ten cents extra for postage, making $1.60 in all, we will present either one of the eight books described below (the choice to be named at the time of sending the subscription), and BOTH of our great Pictures, "Christ before Pilate" and "Christ on Calvary." Of the eight books four are new, and all are valuable and profusely illustrated. Concerning the two pictures, which thousands of our readers have now received, we have from all quarters testimonials to the satisfaction of the recipients, and thanks that they have been enabled to become the possessors of such works of art.

OUR HOMES; How to Beautify Them.

The taste for beautifying homes has steadily and rapidly developed during the past ten years. It is not alone the mansions of wealth and luxury which have experienced the results of this decorative advancement, but the humble homes everywhere through the land reveal the beautifying touch of taste and skill.

This volume aims to aid those who desire to ornament, decorate and beautify their homes with the labors of their own handiwork. It contains suggestions and directions for such household adornments as can be made in spare moments, requiring merely good taste and skill.

150 Illustrations. Cloth, 12mo. Price, Post-paid, $1.00.

FENCES, GATES AND BRIDGES.

Many works have been published upon rural architecture, and almost numberless plans, not only for the dwelling, but also for barns and all other out-buildings; but this, we believe, is the first book published devoted altogether to fences, gates and bridges. It has not come before its time. Multitudes throughout the country will be glad to secure such a work. It is packed full of most useful information. Who that lives on a farm, or in any country village, has not been compelled to give time and thought and work to either fence or gate or bridge, if not to all these, about his house?

This book comes now as a helper. It describes the different kinds of fences: the rail and other primitive fences; stone, sod, board, picket, barb-wire fences; portable fences and hurdles; hedges; fences of barb-wire and boards; fences for streams and gullies. It tells all about making and setting posts, post holder, post driver; drawing, lifting and splitting posts. It describes and illustrates many kinds of gates and fastenings, wickets and stiles; and there is also a chapter on fence law, and one on country bridges and culverts. The three hundred illustrations are mainly those of fences, gates, etc., which have been made and used, and their value thus proved.

300 Illustrations. Cloth, 12mo. Price, Post-paid, $1.00.

FARM APPLIANCES.

Describing Many Useful and Labor-Saving Appliances.

The time has long gone by when men were compelled to work their farms with the simplest, roughest implements, "main strength" being what they had to depend upon, chiefly, for getting through the daily round of toil. All that is changed, and wonderfully for the better. This most useful and attractive work, with its two hundred and fifty illustrations, gives a good idea of what revolutions many inventions have wrought in the modes of farming. It tells how to make simple appliances which help one to do the work of many, which secure comfort to the animals about the farm, which supply the house with good water, which save time and are a constant help. There are chapters on appliances for the barn, pasture and dairy; for the garden and orchard; for handling hay and corn fodder; for slaughtering and curing the meat. There are descriptions and illustrations of wells, pumps, cisterns and filters; of stump-pullers, derricks and slings; of vehicles, rollers, harrows and markers. In fact, it would be difficult to find, in any one book, so much useful, valuable and practical information for any person at all interested in labor-saving appliances as is crowded into this useful volume, which is so fully and copiously illustrated.

250 Illustrations. Cloth, 12mo. Price, Post-paid, $1.00.

PROFITS IN POULTRY.

Useful and Ornamental Breeds and their Profitable Management.

Giving full descriptions of useful and ornamental breeds of poultry, and their profitable management. It is a most profusely illustrated volume of everything pertaining to the successful raising of poultry—equally valuable to the amateur fancier, the professional breeder, or the farmer. A thoroughly practical work, embodying the experiences and practices of the most prominent and successful poultry raisers, which has at once become the recognized authority. The teachings of the work are not of a local character, but are adapted for all localities and climates. To the novice, as well as to the more experienced poultryman, it is of inestimable value, whatever the objects may be—the production of eggs, broilers, table or market fowls. The chapter on artificial incubation alone is worth many times the price of the book, to any one engaged in poultry raising as a business. Such a work has long been wanted, and no poultry raiser, whatever his country or latitude, can peruse it without profit and pleasure. Though published only a comparatively short time, we have had to issue ten editions to supply the demand.

100 Illustrations. Cloth, 12mo. Price, Post-paid, $1.00.

FARM CONVENIENCES.

A Practical Hand-Book for the Farm, describing all manner of Home-Made Aids to Farm Work. None of these Contrivances are Patented, and all Farmers can readily make most of them for themselves.

A Manual of what to do and how to do it. Made up of the best ideas from the experience of a large number of practical men. Every one of the two hundred and forty pages and two hundred engravings teaches a lesson in itself in Farm Economy.

This invaluable book contains simple and clear descriptions of labor-saving devices for all departments of Farm Work. It abounds in important hints and suggestions to aid farmers in the construction of these labor-saving devices. The volume is, so to speak, a complete hand-book for doing every-day work quickly and readily.

It will be seen from the above that this book covers a large field, and the need of this has long been felt, and it is certain to fill a most important place in the farm library.

200 Illustrations. Cloth, 12mo. Price, Post-paid, $1.50.

HOUSEHOLD CONVENIENCES.

Every Housekeeper can save many times the cost of the work by providing herself with a long list of cheap, easily constructed labor-saving devices. The secret of success in housekeeping is knowing how to do things quickly and well. "Household Conveniences" is a key to this secret.

A Most Complete Volume, filled with valuable Hints and Suggestions for doing all kinds of Work in the Household. None of these contrivances are patented, and all Housekeepers can readily make them for themselves.

Chapter I.—ABOUT THE HOUSE. Chapter II.—THE CELLAR. Chapter III.—THE KITCHEN. Chapter IV.—PANTRIES AND CUPBOARDS. Chapter V.—THE DINING-ROOM. Chapter VI.—THE SITTING-ROOM. There are other chapters on the Library, the Sewing-Room, &c., &c.—all making the most exhaustive work of the kind extant. This Volume abounds in common sense hints and suggestions from scores of experienced housekeepers, is within the reach of all, and should be a daily consulted work in every home.

200 Illustrations. Cloth, 12mo. Price, Post-paid, $1.50.

BARN PLANS AND OUTBUILDINGS.

A Most Valuable Work, full of Ideas, Hints, Suggestions, Plans, etc., by Practical Writers, for the Construction of Barns and all Outbuildings.

Chapters are devoted, among other subjects, to the Economic Erection and Use of Barns, General Farm Barns, Cattle Barns and Stables, Dairy Barns, Sheep Barns and Sheds, Carriage Houses, Poultry Houses, Piggeries, Tool Houses, Corn Houses and Cribs, Ice Houses, Ice Houses and Cool Chambers, Dairy Houses, Spring Houses, Granaries, Smoke Houses, Dog Kennels, Bird Houses, Root Cellars and Root Houses.

The *very large number of Illustrations*, more than Two Hundred and Fifty in all, constitute a most important feature of the work, presenting to the eye, as they do, designs and plans for every kind of Barns and Outbuildings.

The proper and economical erection of Barns and Outbuildings requires far more forethought and planning than are ordinarily given to their construction. A barn once built is not readily moved or altered in size or shape, and the same may be said of a corn-house, a poultry-house, or even a pig-pen.

257 Illustrations. Cloth, 12mo. Price, Post-paid, $1.50.

COTTAGE HOUSES,

FOR VILLAGE AND COUNTRY HOMES.

Together with Complete Plans and Specifications. By S. B. Reed, Architect, author of "House Plans for Everybody," etc.

General descriptions, and detailed estimates of materials, construction, and cost, are given with each plan—by which any intelligent person may readily comprehend the character of the buildings, and which will enable any builder of ordinary experience to prepare his estimates—corrected by the varying circumstances of locality and prices, and proceed to their erection. Nearly all these plans have been built from, and their practicability proven. They embrace a great variety of arrangement, and are adapted to meet the general want for convenient, comfortable, and economic homes.

100 Illustrations. Cloth, 12mo. Price, Post-paid, $1.25.

O. JUDD CO., 751 Broadway, New York.

A Great Number.

The AMERICAN AGRICULTURIST for May, in its artistic appearance, as well as in the variety and value of its reading matter, is one of the best numbers issued during its long career. It opens with a full-page engraving, entitled "A May Day Outing." Another full-page engraving represents "Early Morning Call in the Alps." Among the Live Stock Portraits, for which the AMERICAN AGRICULTURIST has always been famous, are Horses, Cattle, Swine, Sheep, and Poultry. Then there are plans of dwellings and outbuildings, new devices and labor-saving implements, flowers, useful and ornamental plants, etc. A. B. Allen, one of the founders of the AMERICAN AGRICULTURIST, treats on the proper feeding of horses; Joseph Harris contributes an article on the Culture of Beans; Seth Green, the New York State Fish Commissioner, gives farmers practical instruction in Fish Culture; Chester P. Dewey discusses the Adulteration of Milk, and the workings of the "Milk Trust." Mrs. Mary Treat continues her talks on Insect Enemies of Plants. Among the well-known writers in this number are Dr. A. G. Chase, W. W. Meech, Miss M. Morgan, John J. Willis, C. L. Allen, James K. Reeve, A. M. Clough, M. B. Faxon, Miss E. K. Winans, A. H. Duff, A. S. Fuller, Geo. A. Martin, Drs. Geo. Thurber and F. M. Hexamer, and many others. The Household and Boys' and Girls' Departments are even more interesting and entertaining than usual. The publishers, as well as the editors, have set themselves to work to bring every department of the periodical to the highest degree of excellence, and to make every number better than its predecessor.

Offer of Special Premiums Extended.

Read the description of "Eight New and Standard Works" on another page, a choice of which, with the two pictures which have been so gladly received by thousands, is offered with the AMERICAN AGRICULTURIST to subscribers within thirty days—the offer being extended from last month.

For Your Friends or Neighbors.

We shall take great pleasure in forwarding specimen copies to the friends or neighbors of any present subscriber of the AMERICAN AGRICULTURIST who will send us the names of such, in order that they may see for themselves the improvements that have been made in this journal.

Catalogues Free.

If any one of our readers is in want of books helpful to garden or farm work, he is invited to send his address on a postal card, and our fully illustrated eighty-page catalogue of works pertaining to rural life will be sent him.

Beautify the Home.

One of the most popular of the useful books recently published is that entitled "Our Homes; How to Beautify Them." Its title suggests at once the subjects treated. Another exceedingly valuable work for those who have more or less of land about their homes is Long's "Ornamental Gardening for Americans." It is very fully illustrated, and cannot fail to be greatly helpful to all who would beautify the grounds about the home. Both are supplied from this office, price $1.00 for "Our Homes," and $2.00 for "Ornamental Gardening," post-paid.

Gleanings from Home and Abroad.

The French budget for "the direction of agriculture" last year amounted to about ten million dollars.

The Forest Department in India contributed, in the last year reported, one million and a half of dollars to the support of the Indian government.

In Indiana there are nineteen counties which have coal mines. Of these Clay County has thirty-eight. The total coal output in 1887 was three and one quarter million tons.

The guardians of Fulham (England) workhouse have substituted the best Dutch margarine for butter in the supplies for the paupers of that establishment. Pity the guardians are not placed on the same diet.

The *Iron Age* says that there are forty-four manufacturers of barbed wire in the United States, that they can run out in two hundred working days three hundred thousand tons of wire, while the consumption is about half that amount. This wire should be cheaper.

A rattlesnake bite was cured at Atlanta, Ga., recently by a hypodermic injection of permanganate of potash; a solution of two grains to an eighth of an ounce of water. This remedy was first practised in Brazil, and the fortunate doctor who used it was rewarded by the government.

The *Maryland Farmer* urges farmers to organize against the "Trusts," and secure laws that will effectually wipe out these monopolists, who fill their pockets at the expense of honest industry. As Burke said of the army contractors, "Their equipages gleam like meteors, their palaces rise like an exhalation."

The *Popular Science News* thinks that Germans as a race are quite as nervous as the Americans. The class of functional nervous diseases under the head of "neurasthenia" was first studied and described by German physicians. The *News* is not a believer in the popular "American type" as it is generally exhibited by writers upon health topics.

Coleman's Rural World has little doubt that the farmers of Missouri lose millions of dollars annually, because of the unnecessary and cruel slaughter of birds. The same may be said of nearly all the States in the Union. A strong public sentiment against the wanton slaughter of these little creatures should be organized and made effective.

The *Mark Lane Express* states that the existing agricultural colleges in England are in need of State aid, and that their charges are far beyond the capacity of the tenant farmers for whose benefit chiefly these schools are established. The price of board at the Cirencester College and at Downton is six hundred and seventy-five dollars per year, and at Hollesley Bay from four to six hundred dollars per year.

The gold medal of the French Ministry of Agriculture has been awarded to an English firm, W. & A. Gilbey of London, who have had, since 1875, an estate of four hundred and sixty acres at Loudenne, on the river Gironde. The vineyards occupy two hundred and fifty-five acres, and the remainder is devoted to meadow and pasturage. The wine stores on this estate have a capacity of ten thousand hogsheads of wine, and the cellars of four hundred thousand bottles.

A writer in the *Ohio Farmer*, who keeps sixteen cows and milks them all himself (he says he is one of those fellows that thinks the wife and daughters have no place in the cow barn), reports an average profit for each of these cows of fifty-five dollars and twenty-one cents during last year. His cows are of no special breed, and most of them were raised by himself. This farmer is very sure that the profit he makes can be made by others, provided they will work more and complain less.

Some seven million acres of land granted to the Canadian Pacific Company, and held latterly at from three to five dollars per acre, have been transferred to the Canadian government at the rate of one dollar and a half per acre. These lands are to be opened to the public, and sold with a view to a speedy settlement. This arrangement adjusts a difficulty which has existed between the railroad company and the people of Manitoba, and good results to that Province are expected.

A few years ago the British consul at Copenhagen reported that the Denmark butter was execrable. Now Denmark has ten dairy schools aided by the State, and the butter from that country is recognized as of the highest quality. In 1867 the exports to Great Britain were eighty-one thousand hundred weights; in 1877 they were two hundred and ten thousand; in 1887 they were four hundred and eighty-eight thousand. This great increase is due to the development of the processes for making better butter.

The boles of the oaks and elms of great age and large size in English forests have a hight of not more than thirty feet fit to measure as timber, while the tops are a perfect forest of branches, small and great. In the forest of Fontainbleau, in France, the boles are straight as arrows, stand very close to each other, and shoot up to hights of from fifty feet to seventy feet or more without a bend, and the question is asked in the London *Garden* whether the excessively thin forests of Great Britain are a national blunder, if not a crime.

An elaborate report recently made by the French government shows that of the total population of France forty-eight per cent are in the rural class. In this country the rural class is more than seventy-five per cent of the entire population. The total number of farms in France is five million six hundred and seventy-two thousand. Of the whole number thirty-eight per cent are under one hectare each (two acres and a half), and thirty-three per cent between one and five hectares. The farms of one hundred acres and upwards number one hundred and forty-two thousand.

There has been organized in Baltimore an association of fruit and produce growers and farmers of the counties on the Chesapeake Bay, with whom are associated sundry merchants of Baltimore engaged in the produce business, the object of which is to procure a more uniform, regular and profitable distribution of the products raised in those counties. They have placed some three hundred towns on their distributing list, which will be supplied by the farmers and cultivators, and arrangements are made by which the products in transit can be shipped to other places, if the market, like New York, Philadelphia, or Boston, to which they are dispatched, is glutted at the time. This appears to be a very desirable arrangement for the farmers.

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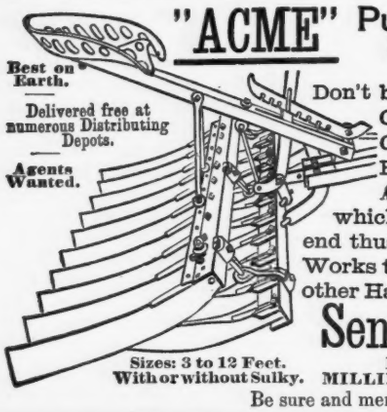

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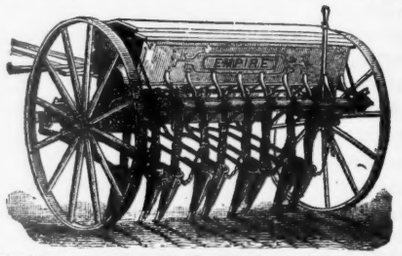

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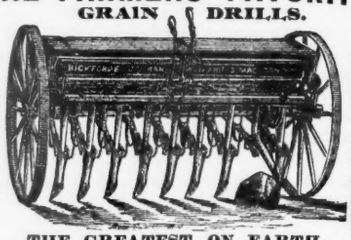

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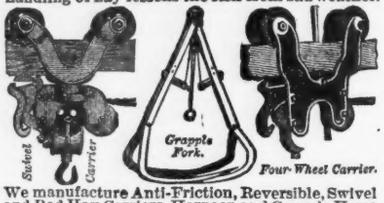

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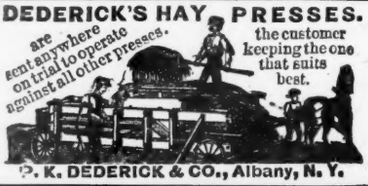

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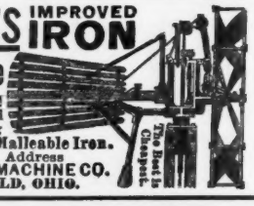

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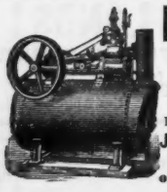

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Words of Approval.

A correspondent from Indianapolis, who is both a doctor and a farmer, writes us that he was in the habit of seeing and reading the *American Agriculturist* many years ago in Pennsylvania, but had since been deprived of that journal. Having an opportunity to subscribe a few weeks ago through a local agent, he says: "What a change within these years! While science, art and literature generally have been on the onward march, the *American Agriculturist* has surely kept in line both as to matter and mechanical execution. It certainly deserves to occupy a proud eminence among its rivals in the field for the farmers' patronage. I have closely examined your publication 'Fences, Gates and Bridges,' and I consider the hints, suggestions and illustrations it contains, as eminently practicable and economical, besides being much simplified and very comprehensive."

Mr. Roelfs, of Peoria Co., Illinois, writes us: "I have received the two pictures, 'Christ before Pilate' and 'Christ on Calvary,' in good shape, and they are far more than I expected. They are always instructive to old or young, and I consider no home complete without them, and am very thankful that you can give so much for so little."

The Rev. William Walters, of Adams Co., Nebraska, a new subscriber to the *American Agriculturist*, writes us: "In addition to the two pictures, which are worth double the price I gave for the whole, I find the *American Agriculturist* itself the best return. I am beginning to be interested in farming, and really enjoy the monthly visits of your paper. It is gotten up well, is fit for any table, and its articles show thoroughness and competency. One especial recommendation for a family is that it is free from advertisements that are objectionable."

Mr. A. B. Allen, one of the founders of the *American Agriculturist*, and now a resident of Tom's River, New Jersey, writes us: "The larger-sized type now used by the *American Agriculturist* is a great improvement, and makes a pleasure for the eyes to read. I think it is a great literary curse to use such small type, and especially when set solid, as our newspapers and many books and periodicals do. Thousands of readers sadly injure their eyes from it, and some entirely ruin them."

New Books.

Parsons on the Rose.—A Treatise on the Propagation, Culture and History of the Rose. By S. B. Parsons. All lovers of the "Queen of Flowers" will welcome this new and revised edition of the work which is recognized as the best practical manual on rose culture now before the public. It embodies the long practical experience and observation of the author. The lists of varieties include the old favorites which have stood the test of time, and the more recent candidates for public favor. In addition to the practical matter, which makes it a complete and invaluable hand-book for every rose grower, the chapters on the history, literature, and what may be called the poetry of the rose give the book a charm for the general reader.—Orange Judd Co., $1.00.

Keeping One Cow.—New, revised and enlarged edition, giving the experiences of a number of practical writers and dairymen, in a clear and condensed form, upon the management of a single milch cow. The number of families throughout the country that keep each a single cow, is relatively greater now than it was a few years ago. Population steadily gravitates to the cities and villages, where the family cow is regarded as a necessary part of the domestic establishment. Hence there is an increasing call for this useful manual, which embodies about all that is needed in the way of practical experience and suggestions of those who have studied the subject of keeping a cow. It is illustrated with representative portraits of various breeds of cows, and is not only a valuable practical hand-book, but is also full of delightful reading for every one interested in rural affairs. Orange Judd Co., $1.00.

The Dairyman's Manual.—A Practical Treatise on the Dairy. By Henry Stewart. For several recent years there has been an ever-increasing want of a work on dairying which should be abreast with modern methods and improvements. The works of Willard and Arnold on the same subject, though of high excellence at the time they were written, have become practically obsolete by reason of the rapid advances which have been made in dairy processes during the last two decades. The centrifugal separator, improved devices for deep setting and churning, the extensive adoption of the silo and other recent innovations have to a large extent revolutionized the business of dairying. The work just published fully answers the demand. Its author was eminently well equipped for the task by thorough education, habits of close observation, long scientific investigation and successful practical experience of many years in managing a dairy farm. It is well that the work fell into such able hands. It is a complete hand-book of dairy farming, setting forth in clear and lucid style the whole science and practice of dairying in accordance with the best and most advanced methods. It is profusely illustrated. Orange Judd Co., Cloth, $2.00.

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RICHARD H. YOUNG, Westboro, Mass.—"Chicken Fixings." Catalogue and Price List of "Silver Finish" brand Galvanized Nettings, Poultry Supplies and high grade Poultry.

A Stud-Book for French Coach Horses.—The leading American importers and breeders of French coach horses have organized an association for the purpose of preserving the purity of the breed, and the publication of a stud-book. The rules of entry to the stud-book are such as to admit only imported stallions and mares approved by the French government, and their progeny foaled in this country. S. D. Thompson, Wayne, Illinois, is the secretary.

Holstein-Friesian Cattle Association.—At the annual meeting of the Holstein-Friesian Cattle Association of America, held at Buffalo, New York, the following officers were elected for the current year: President, Martin L. Sweet, of Grand Rapids, Mich.; First Vice-President, Edgar Huidekoper, of Meadville, Penn.; Second Vice-President, Eugene Smith, of Nashville, Tenn.; Third Vice-President, F. L. Houghton, of Putney, Vt.; Fourth Vice-President, W. M. Liggett, of Benson, Minn.; Treasurer, W. Brown Smith, of Syracuse, N. Y.; Secretary, Thomas B. Wales, Jr., of Iowa City, Iowa; Directors, William M. Singerly, of Philadelphia, W. G. Powell, of Springboro, Penn., and T. G. Yeomans, of Walworth, N. Y. It was decided to hold the next annual meeting in New York City.

"Our Eastern Blizzard."—It is kind for our Western friends to express so much sympathy with New York and "along shore" for a few hundred miles, on account of the blizzard of March 12th. Some of the good Dakota people telegraphed to the Mayor of New York, and offered to contribute "money, clothing, or food—whatever was most needed." (They forgot to mention snow shovels. There was the rub!) Our friend R. G. Newton, Faulk Co., Dakota, wrote us: "Dakota sends sympathy and condolences to the blizzard-stricken East. Had such a storm visited this region there would have been but few survivors. We can imagine its severity, but it has never been realized here. Our storm of January 12th was as a zephyr to a hurricane in comparison. Moral: Dakota is a good place to come to."

Lower Postage on Seeds.—A determined effort is being made for the reduction of the postage on seeds from sixteen cents a pound to four. Such a bill has passed the Senate and is now before the House. Four cents a pound is the Canada rate, and seeds sent to Canada by express can be mailed there and carried to destination in the United States for this sum, which is one-fourth the rate established by our law. The only opponents of the proposed cheap rate are the express companies. Every farmer, every gardener and florist, is directly and personally interested in this cheap postage. Every reader of the *American Agriculturist* has a practical interest in this matter. With cheaper postage, seeds will be cheaper, and within the reach of all. Let our readers work for this reform. Write your Congressman.

Business Department.

A Useful Guide.—A small volume entitled the "Buyers' Guide," has just been issued from the office of the *Farm Implement News*, Chicago, which contains a vast store of information regarding improved farm implements and machinery, and their manufacturers.

Good for the Fowls.—Messrs. F. C. Sturtevant & Co., Hartford, Conn., make an "Imperial Egg Food," which contributes greatly to the success of poultry keeping wherever it is used. It is not a stimulant, but a skillful combination of certain food constituents, which promotes the growth and vigor of the fowls, and increases the egg production. It is not an expensive commodity, the cost being less than one cent a week for each fowl. All who have poultry will find it worth while to try it.

The War with Insects.—The most formidable and destructive enemies of the fruit grower are the creeping and flying hosts of predatory insects which infest the orchard and fruit garden. In the constant warfare with the codling moth, tent caterpillar, and many other insect pests, arsenical poisons and kerosene emulsions have proved the most available weapons. Secretary Hammond, of the Illinois Horticultural Society, reports that he sprayed three hundred apple trees with one pound of arsenic compounds mixed in two barrels of water, and, though the bloom had been sparse and unpromising, the trees ultimately yielded over five hundred bushels of apples, while from the same number of trees not so treated he did not gather a peck of perfect fruit. He made the application the first part of June, using a Lewis Combination Force Pump, made by Lewis & Cowles, Catskill, N. Y., as the implement best adapted for the purpose. The same appliance is equally useful in applying emulsions or arsenical poisons, as well as for washing wagons, buildings, and for extinguishing fires.

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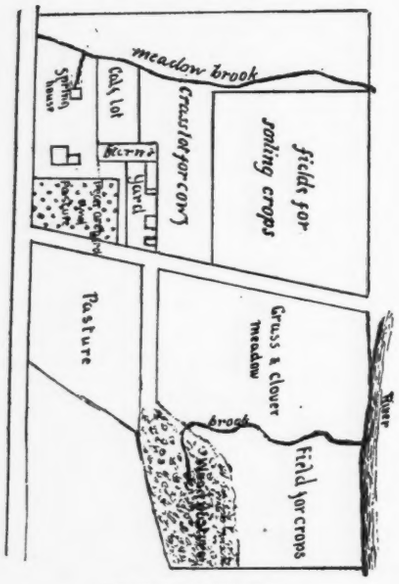

PLAN OF A DAIRY FARM.

OVER ONE HUNDRED ILLUSTRATIONS.

The dairy industry has advanced with greater strides during the last two decades than any other of the great agricultural interests. Formerly it was mainly confined to New England and the Middle States. Now, however, in the prairie States, dairying has become a leading industry, and it is notable that in the more recently settled Territories of the Northwest, the cheese factory or creamery is one of the earliest features in a new settlement. During the period referred to, the entire business of dairying has become almost revolutionized. The extension of the associated system, the invention of new and greatly improved implements and machinery, and new processes, have occasioned these radical changes. The Dairyman's Manual embodies a full knowledge of improved methods, and all that is latest and most valuable in dairy lore. Its author has long occupied an advanced position in the march of dairy improvement, as a practical dairyman, a scientific investigator, and a writer for the press. The book embraces the entire subject, and will prove a trustworthy hand-book to every one who is interested in any department of dairying.

TABLE OF CONTENTS.

CHAPTER I. Dairy Farming.—II. Dairy Farms.—III. Cows for the Dairy.—IV. Breeding and Rearing Dairy Cows.—V. Crops for Dairy Farms.—VI. Grasses for Pastures and Meadows.—VII. Soiling and Soiling Crops.—VIII. Ensilage of Fodder.—IX. Dairy Buildings.—X. Water Supply.—XI. Foods for Use in the Dairy.—XII. Feeding Rations.—XIII. Management of Cows in the Stable.—XIV. Rearing Calves for the Dairy.—XV. Milk.—XVI. Cream.—XVII. Milking and Milking Apparatus.—XVIII. The Care of Milk.—XIX. Cream and its Peculiarities.—XX. Churning and Churns.—XXI. Butter.—XXII. Creameries.—XXIII. Ice Houses.—XXIV. Cheese Making.—XXV. Milk Dairying.—XXVI. Winter Dairying.—XXVII. The Family Dairy.—XXVIII. Diseases of Cows.

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